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Practice makes perfect?

Practicing veterinarians' information seeking behaviour and information use: implications for information provision.

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November 1999

Submitted in partial fulfilment of the requirements
for the degree of MSc in Information Science

Abstract

A random sample of UK veterinary practitioners was surveyed to identify key issues in veterinary information use (IU) and information seeking behaviour (ISB) and the corresponding implications for the Royal College of Veterinary Surgeons Wellcome Library (RCVSWL). Interviews were also conducted with a small cross-section of the sample population to explore in more detail particular areas and attitudes with regard to information provision. It was found that despite a significant use of Internet and email, journals, textbooks and conferences were the three favourite source types, although email was the preferred communication medium. Variations in information source use by practice size and type and information type were also considered. Books were the emergency source of choice while journals were used for current awareness. ISB comprised just under a third of all computer activities and was generally a solo and private activity. Time and cost factors were regarded as the main barriers to effective ISB while currency was the primary problem associated with information sources. Credibility of source was the main criterion used when evaluating information. Some experimentation with non-textual information was noted. Specific library findings included very low use of online library catalogues and minimal email contact between practitioners and librarians. A greater proportion of respondents used the Net for veterinary information than used a veterinary library, despite the former's inherent problems. The majority of library users and non-users wanted enhanced access via the Internet. It was found from the interviews that while publicity and promotion of existing services would enhance library awareness, online access to full-text journals would be the main service requirement for the future. A possible information skills training role for libraries was identified. Recent RCVSWL activities and possible service models were discussed in the light of the findings and specific recommendations for action proposed.

Contents

Contents

1 - Acknowledgements

The idea for this dissertation was originally proposed by Tom Roper, Head of Library and Information Services at the Royal College of Veterinary Surgeons Wellcome Library (RCVSWL). I was given the opportunity to 'run with it' with appropriate guidance and input from Tom along the way. I would like to thank him for his time, use of resources and provision of champagne.

I must also thank John Collins and Washiela Jacobs for providing me with the RCVS crest and (crucially) the RCVS Members and Practice databases.

My friend, Simon Jackson, Librarian at the Royal Veterinary College Library (RCVL), is thanked for his support, advice and supply of documents.

At City University, I would like to thank David Bawden for his patient supervision and the Department of Information Science office staff for their patience.

Thanks to Liz Armitage, ex colleague at the London Business School Library for her help in preparing all the envelopes and labels for the survey.

On a personal note, I must thank my mother and father for all their support over the years. I thank Yioda, my partner, for being my co-driver during the interview stage and my proof-reader during the final stages and for generally putting up with me and 'my ever changing moods'.

This dissertation is dedicated to the memory of my animal loving cousin, Jenny Derwent, R.I.P.

2 - Introduction

Librarianship and Information Science (LIS) research in the field of veterinary science is rare – arguably, the last UK LIS study was carried out by a student at City University back in 1993, before the 'information explosion' occasioned by the Internet. This means that veterinary information services (VIS) are effectively operating in a vacuum with regard to their users, especially where electronic information is concerned. This has particular resonance for vets working in practice, vets 'on the front line', as it were, who work remotely alone or as part of a small team without the information support services and resources that are on offer to their peers employed by the government or in academia. How can VIS provide a service if they do not know what information, in its broadest sense, vets need or want? How can information be delivered in the appropriate format if users' and potential users' technical resources are not known?

Questions such as these are not posed for the sake of academic curiosity but in order to determine effective service delivery. A good example of this in the last year or so is that VIS like RCVSWL and RCVL are investing heavily in the next generation of online public access catalogues (OPACs) for their collections which enable remote catalogue interrogation/ interaction via the client World Wide Web browser. It is obviously desirable for the VIS to determine vets' opinions about such online services: whether they have the time, resources or inclination to use them or even more simply, whether they fulfill a need. This is the kind of knowledge required if budgets are to be allocated wisely and the real information needs of the veterinary profession are to be anticipated and met in the next century by VIS .

This study therefore, aims to give VIS (specifically, RCVSWL) an insight into UK veterinary practitioners' information gathering – their habits, attitudes, views and needs – so that appropriate services can be delivered.

3 - Aims & objectives

The dissertation aims to take a sample of veterinarians in practice and discover where and by what means they look for the information they need and what use they make of it. Findings will be analysed and issues relating to future information provision from RCVSWL considered. This study is a localised, microenvironmental study which, it is hoped, will complement a future macroenvironmental study on vets' information needs.

The objectives of the project are best illustrated as a series of questions which the ultimate findings are intended to answer as fully as possible:

- What information sources are being used?
- Are some information sources used more than others?
- What are the variables that determine this?
- How long does it take for satisfactory information to be found?
- Are intermediaries used in the search process?
- What use is made of information technology in the search for, and delivery of, information?
- From what sources do vets obtain non-clinical information?
- What can libraries/information services do or offer to help practicing vets?

4 - Scope & definitions

The study will be confined to a sample of veterinarians working in general practice in the UK. The term *vets* will be used to denote this group.

Information need (IN) is defined as a gap in an individual's state of knowledge that has been recognised by the individual or identified by another person. If the individual is unaware that a knowledge gap exists, this is known as a *dormant need*. If the individual is aware of the gap but chooses to ignore it, this is an *unexpressed need* (after Nicholas, 1996).

Information-seeking behaviour (ISB) is defined as any means of resolving an information need undertaken by (or on behalf of) an individual.

Information use (IU) is defined as the way in which a given information source is exploited by an individual to satisfy an information need.

Information service is defined as a formal arrangement to provide information in the appropriate form and via the appropriate channel as needed by the user.

Veterinary information – Blood & Brightling (1989: 1) provide a working definition:

> '…information…to improve the accuracy of [veterinarians'] decisions made about the health and productivity of animals under their care.'

However, it is suggested that this definition is too broad for the purposes of this study. If we consider the traditional client/patient/veterinarian relationship illustrated as a cycle in Figure 1, it can be seen that the nature and format of veterinary information as defined above will vary at the different stages of the cycle. In the pre-diagnosis stage, for example, where the vet is trying to work out the problem at hand, the information inputs required for decision-making can take the form of:

1) the knowledge accumulated by the veterinarian during his working life and his veterinary education
2) data gained from his own senses during the physical examination of the patient (and its environment when necessary)
3) data gained from the client (oral histories) or written records
4) data gained from paraclinical tests

(The use of the word 'data' is deliberate here, as the figures facts and details recorded will have no meaning until they have been interpreted by the vet to form information to aid his diagnosis.)

Clearly, much of the information here resides in the vet himself and the processing of it constitutes the 'art' intrinsic to the veterinary profession. This kind of information will be referred to as *primary data* in this study. Only other veterinarians would (and should) be able to provide and process similar data. This is a critical issue as it explains why the LIS professional has no role to play at this stage of the cycle. For although he could advise the vet on appropriate practices for the storage of the clinical data gathered, *he could not supply or source the data itself*.

The situation changes when the other stages of the cycle are considered: 'accurate diagnosis, prognosis and therapeutic decision making depend on the inclusion in the information base of all diseases recognised as separate entities, including the rarest and most obscure…' (Blood & Brightling, p.62.) The authors were discussing vets' own localised store of information with the implicit assumption that vets need to draw on a variety of information sources (in the most general sense) in order to create such an information base. Nor will disease information be the sole focus, information on treatment and control programmes (including pharmaceutical information) will also be required. This, then, is the type of veterinary information which is of most interest to VIS and to this study and the following revised definition is proposed:

> information other than primary data used to improve the accuracy of veterinarians' decisions made about the health and productivity of animals under their care.

Professional information – vets will require other types of information throughout their working lives as part of their professional status. Included within this category would be information relating to legislation, codes of conduct, veterinary politics, continuing professional development (CPD) and so forth.

Practice information – this category of information is essential to the day-to-day existence of the practice in which the vet works. It encompasses all the elements of practice management as well as information relating to the locality and the client base.

It is hoped that this study will determine if and how veterinary information services can help vets with these two types of information.

Knowledge base – this term will be used as a global term for veterinary, professional and practice information as defined above.

5 - Research context

Although the focus of this study is not the IN, ISB and IU of users of a particular library, rather of users of a certain category of information which may or may not reside in a library, it does fall under the domain of (library) user studies and thus part of a research tradition dating back to 1916 (Wilson, 1994).

One of the reasons for the continued activity in this field of research is that the term 'user' (and hence a user's IN, ISB and IU) can be constantly reapplied and redefined over time as society (and the research environment itself) changes. It is fair to state that there are a seemingly limitless number of user study permutations on a broad to narrow spectrum. If we take a fictional study of, say, students using a university library as an example, the investigation could look broadly at all students registered at the university or more narrowly at a particular sub-category (undergraduate, postgraduate, mature, visiting, foreign, part-time, full-time etc) or narrower still using a definition based on subject studied, distance travelled, resources used etc. Similar cross-sectioning can be (and has been) applied to other categories of users in society. There is nothing unusual about this process, of course, it is intrinsic to scientific investigation.

However, in the case of the 'soft' social sciences and LIS research, these factors inevitably lead to attempts by researchers to try and pin down the subject by establishing narrow boundaries of reference, ultimately producing small scale, localised user studies. Such diversity invariably leads to research fragmentation and heterogeneity with the result that the discipline's body of knowledge fails to advance significantly over time. Vickery & Vickery (1987: 114) have pointed out that 'most of the conclusions that can be drawn from studies of people and information are either very general…or specific to particular social groups or even to a particular organization.' Maurice Line (1971a: 434), writing from the perspective of the Information Requirements of the Social Sciences Project (INFROSS), arguably the broadest user study undertaken to date, described an '…inability to extract from the mass of non-comparable science user studies any sort of coherent picture of the science user'. Reasons for this non-comparability include differing research methods, small sample populations and limited resources, but can also be attributed to the complex interaction between people and information.

Line writes, 'one of the great strengths of INFROSS is that it does provide a mass of *comparable* [author's italics] data within a very broad field…' (p.430). However, Line had the advantage of exploring a large area of virgin territory with the necessary resources. Such a large scale study is unlikely to be replicated, therefore post-INFROSS research has sought to apply Line's framework for investigating IN to sub-disciplines and different user categories – giving rise to the same problem of non-comparability that existed pre-INFROSS. This falls far short of the 'indicators and indexes' called for by Vickery & Vickery to facilitate comparisons between different studies in the middle ground of LIS user studies.

What implications does this research context hold for this particular project? Firstly, that only general comparisons can be made between the various user studies, even between those that have concentrated on the veterinary profession alone. Secondly, that this study is obliged to continue the small scale tradition due to resource constraints, so its significance is limited in that its sample size is statistically too small to draw conclusions for all vets practicing in the UK. However, not only will it provide a vital snapshot of the state of veterinary information in the UK, it will also produce practical recommendations for service provision with an eye on the bigger picture.

6 – Literature review

A small number of veterinary ISB/IU studies have been undertaken previously, drawing on data collected from either questionnaires or interviews (or both). As discussed in the previous chapter, the principal issue here is whether the findings from studies undertaken in countries other than UK have significance or implications for studies on vets working in the UK.

Inkapaahindi (1985) examined the IN/ISB of veterinarians working at the Nigerian Veterinary Research Institute. Despite the author's claims, the sample group is really one of research/governmental vets rather than of vets in general practice. This is an important distinction as the former category of vet have an institutional library at hand. Today, some fourteen years later, one finding is still of interest: information source types ranked by perceived utility (abstracts, periodicals, conferences and librarian). Another Nigerian study by Nweke (1995) examined the ISB of human and veterinary medical scientists in Borno State, Nigeria. Despite using a dual questionnaire/interview approach, findings amounted to a ranked table of information sources used with limited discussion and detail. However, the high rankings awarded to browsing and accidental discovery of information and informal ISB methods in general (i.e. discussion with colleagues, personal notes) merit exploration in a UK context. That aside, the wider significance of this study is limited due to its developing country context, e.g. the high acquisition, subscription and equipment costs faced by libraries using a low value local currency which ultimately severely restricts the quality and quantity of information that can be provided.

More relevant is the research undertaken on American vets. Drake & Woods (1978) describe an ISB/IU assessment undertaken in the planning stage of a Veterinary Medical Information Centre for practicing Indiana vets. The survey results revealed that vets ranked books as first or second sources of both critical information *and* non-critical information. Journals followed by books were the most frequently used sources for new information on diseases, surgical procedures, preventative medicine and food/nutrition whereas sales representatives were the main source of new information on drugs/biologics and equipment. The principal information services required were the opportunity to consult with faculty staff and a current awareness service.

Pelzer & Leysen have contributed greatly to veterinary IN/IU/ISB research. Their key (1991) study surveyed a representative sample of vets working in the seventeen states of America. Apart from confirming Drake & Woods' finding that books were the primary information source used in critical care situations, the study also indicated that relatively little use was made of veterinary medical libraries, computer databases or extension services. The latter point was highlighted as having potentially negative implications for vets' awareness of current issues in preventative medicine and zoonoses. Journals were perceived as the most important source for 'keeping up-to-date', despite the fact, as the authors point out, that the information contained

within would be at least one year old. Finally, although 50% of respondents had the use of a computer, hardly any used it for reprint file storage, database searching or computer aided diagnosis (CAD).

The same authors' research (1988, updated 1998 with Wise) into the library use and ISB of a cross-section of US veterinary medical students is also valuable as it can be used to monitor what (and how) veterinary ISB/IU and information skills develop whilst in training and the extent to which they change once the student becomes a practitioner. The authors found, for example, in 1988 and 1998, that books and course handouts were the most frequently used sources by all types of students – something that would seem to partly explain their heavy use later on in veterinary practice. It was also suggested that students on courses using the problem-based learning (PBL) method of instruction adopted a more aggressive and independent ISB and used computer and electronic resources in addition to books and handouts. The 1998 survey was able to examine student use of electronic resources: *VETCD*, *MEDLINE* and *BEASTCD* were the most popular databases used, illustrating the general shift from print to computer indexes in library ISB/IU since 1988. 38% of respondents had never heard of certain common veterinary Internet resources. However, this cannot be interpreted as a total ignorance of Internet resources, only of those resources specified. In general, veterinary students were pragmatic about using electronic resources, they acknowledged that other resources such as colleagues, CPD courses/workshops and conferences would continue to be the main sources of information for their future education needs.

The few studies of UK vets that have been undertaken tend towards the enumeration and quantification of veterinary information held in practices: numbers of books held, journals subscribed to, frequency of use of external veterinary libraries etc., as opposed to a deeper investigation of IN, IU or ISB. However, Bawden & Valleley's (1996, field work 1993) survey is a good reference for its findings on computer use in practices. Little use was made of computers by vets for storage or retrieval of veterinary information - accounting and administrative tasks predominated. There was a general lack of awareness of electronic resources with only 10% of respondents (n = 100) being aware of specific information sources. Nevertheless, one third of respondents were happy with the amount of information available and the means of obtaining it. The remaining two thirds expressed some degree of dissatisfaction, being time-pressed vets who saw themselves faced with a mountain of information. This could only be addressed by VIS ensuring quick and easy access to information.

Lack of time to read and absorb the veterinary literature was also a conclusion of Raw (1987) who drew on a larger sample (537 practices) and chose to focus on practice library issues – subscriptions, book selection criteria, budgets etc. Three concerns in particular merit attention today. These are ownership, currency and coverage. Raw describes how some practices relied on newly qualified assistants to share their up-to-date university texts amongst staff, rather than

establishing a practice library. These texts would, of course, move on with their owners. On the other hand, if the assistants became principals, the texts would remain in the practice without later updated editions being purchased. The currency problem was also laid at the door of publishers, who, it was claimed, published out-of-date books due to the long lead times in the sector. Coverage concerns the specificity of material published. Vets wanted specialist material aimed at vets in practice rather than specialist 'esoteric' research material appearing in journals. Raw, in defending the academic journal by pointing out that the research of today filters down into the practice of tomorrow, misses the essential fact that his respondents were requesting a selective dissemination of information (SDI) service in all but name. The question is: who should provide this kind of service and how? This an area of interest to the current research and will be explored in both the survey and questionnaire stages.

Gerrard's (1998) research on veterinary practitioners' views on the Internet is perhaps the most directly relevant to this project to date, having a similar sample size (n = 110, 76% returned). He reported that, although the level of Internet awareness was high, most vets were unsure about the Internet and the benefits it has to offer and that this uncertainty was the primary reason for vets not using the Internet. His most important finding was that 46% of his sample had no interest in CPD courses aimed at increasing Internet awareness – a key issue, he reckoned, if the Internet is to be used to its full potential by the profession. The author also debunks the notion that Internet connection/use is expensive and proposes that Internet use in the profession will increase in the future - a result of computer literate graduates entering the profession and society itself becoming more Internet aware, and so the case is made that an Internet presence will become a business necessity for the veterinary practitioner.

As this dissertation was being prepared, a commercial survey by Biggs (1999) was published. This found that 75% of veterinary surgeons in general practice in Britain use computers as a work-aid with 90% of recently-qualified vets being computer users. 75% of vets have access to a CD-ROM facility but less than half are on the Internet. Information on diseases and veterinary products (and their manufacturers) were the main focuses of Internet searches. Computer use was found to absorb on average under 10% of a vet's time. Finally, the author judged veterinary computer use to be 'fairly basic' as statistical analysis and accounting were found to be minority uses. This contrasts with Bawden & Valleleys' findings (above).

Relevant ISB/IU research for other disciplines

Attention should also be given to non-veterinary ISB/IU studies in the allied field of medicine, with particular reference to studies of practitioners working rurally 'in the field'. Once again, questionnaires are the primary method of data collection and research undertaken in the USA is seemingly the most relevant. Gravois et al.(1995) examined ISB/IU of a sample of 71 dental hygienists, a valid reference group for this study as dental hygienists work in small practice

environments similar to those of vets. Two particularly interesting areas explored were information evaluation and perceived barriers to information use. The authors found that personal experience, journal credibility and discussion with colleagues were the most important evaluation criteria – methodology used and author credibility were ranked much lower. The authors' findings on information barriers were less pronounced: while 8 respondents cited time as being a major barrier, 5 were of unaware of any barriers at all. These findings and those on information sources consulted provide a useful counterpoint for findings gained from this research.

Bowden et al. (1994) examined IN/ISB/IU of physicians in 5 Texas counties with particular regard to the availability of the National Library of Medicine's *MEDLINE* database. With such a facility at hand, does it become one of the physician's primary information resources? Their findings were negative - personal collections of books and journals and consultations with colleagues were more important to physicians than *MEDLINE*. It should be noted here that access to *MEDLINE* can be gained via various different channels. Bowden et al focused on use of the dial-up *GRATEFUL MED* variant with a flat-rate charge for use. When considering veterinary database use therefore, access charges and related costs will have to be taken into account as a possible determinant of ISB, along with other factors relating to the channel selected. This, of course, is also true of Internet usage. It may be that vets prefer to use information sources with one-off or standard monthly charges as opposed to 'pay as you go' services, typified by dial-up Internet access on a standard fixed telephone line.

Lundeen et al (1994) used a combination of semi-structured interviews and questionnaires in their examination of information needs of rural health care workers in Hawaii (including, but not limited to, GPs). Results showed that journal articles were 'overwhelmingly' the best resource for meeting IN across all the professions surveyed, followed by colleagues. Barriers to information use cited by these rural workers were (in order of importance): geographic isolation, cost and inadequate technology. This is also a crucial issue for UK vets. Finally, the authors' recommendations for health information services may have some resonance for UK VIS.

Gruppen et al. (1987) raise important questions about practitioners' use of colleagues which merit consideration in a veterinary context. This also featured in research undertaken by Dee & Blazek (1993). Semi-structured interviews supported by 'real life' data gathering with a small sample of physicians serving rural communities in Florida were used to discover IN issues. Their findings on preferred information sources contrast with research cited previously in that journals were ranked after colleagues and medical meetings respectively in terms of popularity. Communication with colleagues was seen as providing immediate, accurate and reliable answers and would save the time and effort required to consult books and journals, even those readily available in the GP's personal library. Minimal use was made of medical libraries due to the time and effort required to track down specific answers. Care must be taken with these

results, however, due to the very small sample used (*n* = 12). Nonetheless, the authors' main conclusion is surely appropriate for this survey and LIS services in general: 'information [supplied] must be immediately accessible, concise, high quality, presynthesized and up-to-date.' (p.263).

Recent work by D'Alessandro et al (1998) on Digital Health Science Libraries (DHSL) for rural physicians may also have implications for veterinary information provision. Finally, Thompson (1997) provides a useful review of the literature on the characteristics of information resources preferred by primary care physicians with reference to ISB/IU.

Outside of the medical domain, work by Ellis (1993a, 1993b, 1997) in academic and industrial environments provides a solid theoretical base for user study research. Wilson (1997) has reviewed non-LIS research on IN and ISB.

Summary

It is suggested that the main points to retain from the Literature Review are as follows:

- Books and journals have traditionally been the principal sources of critical and non-critical information while journals have been used as the primary means of keeping 'up-to-date'. However, the importance of sales representatives as sources of new information on drugs and equipment should not be overlooked.

- Vets are generally pragmatic, cautious and conservative users of information and information technology, sticking with information sources that have worked in the past, especially during their training and use computers mainly for core tasks such as accounting and word processing. This cautiousness is manifesting itself in vets' attitudes towards the Internet but may change with the next generation of vets.

- Time pressure dominates veterinary ISB and consequently there is a demand for quick access to relevant, reliable and up-to-date information. Books and journals fail the currency test due to the inherent delays in the traditional print journal publishing cycle but remain the best option as databases have generally failed the relevancy and access criteria. SDI services could theoretically provide the answer but are unproven in practice [sic].

- ISB/IU research on remote practitioners in human medicine suggests that the importance of colleagues should not be under-estimated, not only in terms of information evaluation but also as an information resource in their own right, more important than any database and, at times, able to satisfy all of the key criteria mentioned previously.

- Finally, the role of the traditional library such as RCVS vis-à-vis veterinary *practitioners* as opposed to veterinary *students* is unclear from the Literature Review, even though it can be guessed at – the supplier of one-off or hard to find information and back-up materials. It is fairly safe to state that the practice library (in whatever form) is more important to the practitioner.

7 - Methodology

Data collection

Every data-collection method has its strengths and weaknesses in terms of producing results that are valid, reliable and consistent. As Robson (1993) points out, we can never obtain results for which *some* method has not been used to collect them. The only feasible strategy to overcome the inherent problems in each is to use a variety of methods, a technique known as triangulation.

With this in mind, the original data collection methods proposed for this study were structured observation, semi-structured interviews and document research (i.e. a literature review). Observation was proposed to counter balance the predominance of questionnaire/interview methods used in ISB/IU studies. However, further consideration of the data to be collected led to a rejection of the observational approach. Returning to Figure 1, it has already been noted that pre-diagnosis stage is concerned with primary data collection and use. An observational study of behaviour undertaken at this stage would produce findings more suited for an appraisal of veterinary skills and techniques rather than ISB in a LIS context. Moving on to the diagnosis and pre-diagnosis stages, it is expected that the vet's own accumulated knowledge would be sufficient to handle many patient problems sufficiently – this is, after all, the original purpose of training specialists in a given discipline. This was apparent to this author recently when observing a consultation as a client in a small animal practice. Veterinary information, as defined for the purposes of this dissertation, was not required in any shape or form.

This means that in order to establish the conditions in which such information would be needed, a long period of observation would be required - a week at minimum but more probably a month. Mullings (1984) considers observation to be unsuitable for recording events that may occur either very rarely or at very unpredictable times, the kind of events at the heart of this study.

Therefore it was decided that questionnaires followed-up by semi-structured interviews would be the primary means of data collection. The advantages of this approach are:

1. A large number of vets can be reached in a wide geographic area.
2. Data can be collected relatively quickly and cheaply compared with other methods.
3. Interviews act as a data check and allow deeper exploration of attitudes and opinions.
4. Questions can be drawn from previous studies and data comparison made to ensure some continuity of research.

The main disadvantage is:

1. A reliance on the good will of vets to participate. Their time is limited and they may not see any personal gain in participating. They may already suffer from 'questionnaire fatigue' - inundated with commercial surveys and those from other researchers.

Gaining access

Anticipating the problems outlined above, an item of pre-survey publicity was inserted into the *RCVS Newsletter* (Appendix A) which is circulated to all RCVS members and a covering letter (Appendix B) describing the nature of the research and inviting participation was sent out with the questionnaires. This was an official letter on RCVS headed paper, signed by Tom Roper, Librarian of RCVSWL. It was hoped that both formal publicity and the official 'seal of approval' from the governing body of the veterinary profession would help persuade respondents to participate.

On a practical level, stamped addressed envelopes were enclosed for completed surveys (horror stories about stamps being steamed off for personal use by irate recipients notwithstanding). Recipients were also informed of the estimated time necessary to complete the survey on the front page. Finally, a small incentive for respondents (as recommended by Oppenheim, 1992) was included – the possibility of winning a bottle of champagne donated by RCVSWL . One completed survey from all those returned would be picked at random to determine the winner.

Confidentiality and discretion were assured at all times. Respondents were informed that no individual would be identifiable and that the data collected would be aggregated. Names and addresses were stored in a password protected database file on a stand-alone computer.

Sample selection

Sampling is a major problem for MSc research limited in time and budget. A 10% sample of the 11300 vets in general practice, for example, would cost £452 in postage costs alone. An attempt was made to calculate the size of a representative sample using the formula below (solving for *n* assuming 95% confidence and 4% error):

$$n = \frac{p(1-p)}{\frac{e^2}{z^2} + \frac{p(1-p)}{N}}$$

where
n = required sample size
N = population size
z = *z* value for which ± *z* corresponds to the desired level of confidence
p = the estimated value of the population proportion
e = maximum likely error that is acceptable

With these typical variables, *n* = 507 vets. This was beyond the budget for this project. Therefore it was decided to use the same size sample as Valleley had used in 1993 (*n* = 100) as a basis but with compensation for a longer survey (*n* = 149). However, this figure is augmented by the addition of the email survey sample (see below for details, n = 60), to produce a total sample population of 209.

There were two possible sampling frames available, both from RCVS. The members database contains every RCVS member's personal details. However, a simple random sample from this frame would include categories of vet that are not required for this project (e.g. retired vets). The other sampling frame, the RCVS practice database, was considered to be more appropriate, although it is reckoned by Roper (1999) to be 500 practices short of the estimated 3900 existing in the UK. While this fact must be acknowledged as inducing an element of bias in the database, for the purposes of this project it may be ignored as the sample itself is not statistically representative.

A simple random sample was selected with the aid of random number tables. It was decided not to emulate Valleley's emphasis on rural practices in the sample (rural roughly defined as areas *not* in the vicinity of a VIS). Firstly, there was a need to establish the general situation with regard to UK vets and information considering the elapsed time since the last veterinary LIS research. Secondly, there is an inherent difficulty in defining a workable definition of a 'rural practice' - neither too narrow so as to exclude all but the remotest of practices or too broad so as to include green suburbs or green belt practices. Thirdly, certain types of practice (equine or large animal) are almost certainly likely to exist in areas considered rural anyway. Finally, it was hoped that the analysis would reveal the rural/urban question to be mere academic argument – for if vets were found to be able to get the right information in the right place at the right time in the right format using a mixture of traditional and new VIS then their physical location would be of no practical significance.

Email survey

An email version of the survey was also sent out to a different sample of vets. The purpose here was to reach more vets than was possible by using the paper survey alone, thanks to the minimal 'postage' costs involved in sending out the electronic version. The sample comprised vets whose email addresses had been added to the RCVS Practice database or whose email addresses had been gleaned from visiting their practice web sites which had been advertised in one of three UK veterinary information gateways: *Vet Web* [http://www.vetweb.co.uk]; *Vet Net* [http://www.vetnet.co.uk] and *VetIndex* [http://www.vetindex.co.uk]. Note that both the email and paper survey responses were analysed together, i.e. using the same coding scheme.

Follow-up letters

A follow-up letter (Appendix F) was sent out via the appropriate medium approximately 4 weeks after the final mail-out of surveys in an attempt to boost the overall response rate. This contrasts with the 10 day delay suggested by Bourque & Fielder (1995: 159). Cost and time factors were the deciding factors here, explaining why the authors' recommendation of using priority post (i.e. recorded / overnight delivery) was also rejected. It was thought that one letter would be sufficient to try and convince hesitant respondents to participate as it was thought that the majority of recipients would have decided fairly quickly on receipt of the survey whether to participate or not.

A letter was used as opposed to a telephone call not only because it was able to convey an appropriate degree of formality for the project but also because it would follow the same path to the respondent as the survey had done previously. Numerous telephone calls may have been needed for each practice before the original recipient could be traced.

Interviews

An 'interview consent' box was inserted at the end of both the email and paper surveys with space for the consenting respondent to indicate the preferred means of contact to make the necessary practical arrangements for any interview. The underlying aim here was an attempt on the part of the researcher to show sensitivity and awareness of the fact that a vet's time is limited and that, while he/she may be willing to spare the time to complete a survey, a cold call from the same researcher requesting an interview as well may be too much and may well have negative implications for future researchers.

It was acknowledged that the number of respondents who declined to be interviewed might well form a sizeable majority of the sample population but it was hoped that they would have at least agreed to complete the survey and so ensure the capture of some data pertaining to their ISB/IU.

Due to cost, time and field research constraints (e.g. selected vets being on holiday), 7 interviews scheduled to last no more than an hour were undertaken. Candidates for interview were selected using three variables: practice type, IT use and location. Practice type was the primary variable as a cross-section of views from veterinary practices was desirable. Practical considerations ultimately took over once a candidate practice had been identified. Was another consenting practice nearby to enable efficient use of time? If so, was this practice of research interest? Would the vet's availability fit around another vet's in order to justify the journey? When issues such as these were resolved, the interview stage could progress smoothly as was experienced during the 'Scottish round' of interviews. A copy of the interview invitation letter can be found in Appendix G.

Table 2 shows the final split of interviews by type. Small animal practices predominates due to that type's share of the total returns and such random factors as one interview practice changing type during the project's duration on account of personal injury.

All interviews were transcribed (Appendix H) to facilitate referencing in the Analysis section of this project.

8 - Survey design

In general, the main aim in designing the survey was to extract as much quantitative and qualitative data as possible without irritating the respondent in the process. It was felt that, once access had been gained, squandering the opportunity to explore vets' current relationships with information by asking a few perfunctory quantitative questions would be a waste of time and effort. Such an approach would replicate, not build on, previous research and thus fall victim to the criticisms regarding social science research highlighted in the Research Context section. On the other hand, a lengthy, complicated survey could lead to a low response rate and/or half completed returns. This meant that a good mix of carefully chosen and structured open and closed questions had to be achieved.

Questions were based on key concepts and issues identified in the Literature Review as well as on the dissertation's Aims and Objectives. As it was likely that vets would not have been asked to consider some of the issues alluded to in the survey, it was felt that it was necessary to insert more closed responses earlier on in the survey to let the respondents get used to the topics involved. Some questions were reproduced from surveys used in previous user studies research and are summarised in Appendix C. Not only did previous studies hint at potentially fruitful avenues to explore, e.g. CD-ROM usage, they were useful in helping to determine the particular turn of phrase needed to tap into respondents' perceptions of a particular issue. In some cases, where closed questions on a particular topic had gained a low response in previous surveys, the question was made open. A prime example concerns CD-ROMs used by vets. Pelzer & Leysen (1998) and Bawden & Valleley all reported low awareness of specific databases. By making the question open in this survey. it was hoped that either a general lack of awareness or a specific lack of awareness would manifest itself.

Paper survey

The 'look and feel' of the paper survey would be crucial in persuading vets to participate in the project. Specifically, the design brief was as follows:

official The RCVS crest was placed in a prominent position at the top of every page and the role of the RCVS was deliberately emphasised in the covering letter.

professional The design was meant to convey that time and effort had been put into the preparation of the survey, that the author was serious in his intentions and that serious issues were being addressed. Clarity and precision were the desired concepts, both in the instructions, layout and use of colour.

interesting It was hoped that blocks of colour would be both appealing to the eye and be a visual guide through the completion of the survey, ie indicating to the respondent that he was progressing gradually through the questions as he moved from block to block as opposed to him staring at stark and dull pages of

black text and white background. Finally, given the strong possibility that vets would be inundated with surveys from a variety of interested parties, it was hoped that an appealing design would have less chance of being rejected at first sight.

Email survey

Once the paper survey had been designed, it was saved as an ASCII text file in *MS Word* and then reformatted in *MS Notepad* for email distribution. It was decided that the safest way of ensuring that readers received the same survey (in terms of design) would be to insert it into the body of a normal email message. This approach would eliminate any potential software compatibility problems and also reduce the Internet call charge for those respondents who use slower modems to dial-up their Internet Service Provider and download their email - the survey file in *Ms Word 97* format was 803KB as opposed to 15K as an ASCII file. This factor was one of the reasons why the survey was not placed on a web site as an online form: it was felt that vets would neither have the time, inclination (or facilities?) to access the site. There was also the question of promotion – how would the sample population know that the site existed? If an email message was needed to inform them then it made sense to send the survey in email format anyway.

The design of the email survey was based on that of the successful free email newsletter *Freepint* [http://www.freepint.co.uk] which is intended for the information professional. Obviously, some of the paper survey questions would need to be rephrased or excluded for this population (e.g. do either you or your practice have an email address?).

9 - Pilot stage

The draft paper and email surveys were sent to a small sample of vets for the pilot stage. A trial random sampling method was undertaken using a sampling fraction of 15. A random numbers table was used to select 10 numbers between 1 and 3249; records with corresponding numbers in the primary key field in the RCVS Practice database were then retrieved. It was realised that these records combined with those records used in the email survey would have to be excluded from the sampling frame for the main sample selection. A return rate of 4/10 (40%) was achieved for the paper survey. 5 records from the 80 with unique email addresses were selected at random for the email survey pilot. 2/5 (40%) were returned.

The purpose of the pilot stage was to test (after Wilson 1996):

1. Response categories for closed questions
2. Clarity of questions
3. Question design
4. Optimum layout, including order of questions
5. Overall length of survey
6. Time taken to complete survey

In fact, the pilot stage highlighted additional issues, such as the continual presence of typographical errors despite careful checking and the clarity of instructions for certain questions. Some respondents, for example, had used a '1' three times in some of the ranking questions instead of the desired '1', '2', and '3' response, thus causing problems of interpretation for the Analysis stage.

Of more immediate concern, however, was the fact that numerous questions had not been answered. As the invitation to comment on the survey was not taken up by any respondents, this suggested that unanswered questions were felt not to apply rather than having any inherent error or defect. On the other hand, hardly any use was made of 'Other' response boxes which suggested that most answers had been anticipated in the closed question categories.

Two questions were removed after the pilot. One question was identified as soliciting a 'nice to know' answer (age at qualification) while the other was deemed to be too blunt and naïve (number of times vets had referred patients due to lack of information). It was felt that interviews may provide a more subtle and appropriate means of obtaining responses on the relationship between information quality and clinical practice quality.

The pilot stage also served as a useful 'trial run' for the main sample stage in terms of administration. In particular, it threw up problems connected with the sampling frame. An

example is the question of addressee. The primary address field in the RCVS Practice database contained either practice names or practicing vet names. A query could be used to link the RCVS Members database to their corresponding places of work but this would often provide four vet names for one practice. Should, then, the envelopes be addressed to the practice itself or to one vet in the practice (and if so, to which particular vet)? If no addressee was given, there was the possibility that somebody other than a vet would open the envelope and fill out the survey. However, it was felt that this possibility could not be eliminated even if a particular vet was addressed – the survey could still be passed on to a non-veterinary colleague. It was decided to use the fields as they appeared, thus treating any named vets as one-man practices, hoping that the official nature of the survey would ensure that it would reach at least one vet. A question was inserted at the end of the main survey to try and identify the respondent, asking them to provide their name (and email address if applicable). Entries in this field could be cross-referenced with the RCVS Practice database later.

A similar problem was found with email addresses for practices. These varied in specificity: 'enquiries@…'; 'info@…' or a named vet. Some were obviously email addresses for the practice, others personal addresses for vets who might or might not have been working at the particular practice. Occasionally, in the case of veterinary practice groups, or veterinary practice companies, only one central email address was available for all the practices in question. Once again, an identification question was consequently inserted in the main email survey to try and overcome this problem.

Some peculiarities unique to email survey returns materialised. Email respondents were more 'verbose' – giving more than one example when only one was expected or writing full (as opposed to abbreviated) answers to open questions. They also adopted a more informal response style, e.g. in one question one respondent entered 'YES YES YES' to indicate a strong preference for information exchange via email.

In general, completion instructions were followed, e.g. using X as a tick and writing in CAPS. There were no instances of question deletions or overwriting. It was not known if the use of 'RCVS@twales.freeserve.co.uk' in the 'From' field of the email message had any negative effect on participation, as opposed to, say, a more official looking 'RCVS_Survey@rcvs.org.uk'.

The pilot stage also provided an opportunity for data capture testing. Initially *MS Access* was chosen for data analysis as it would (in theory) offer seamless interchange and querying between sampling frame data and survey data. It was also felt that *MS Access* forms with look-up fields for entry codes would facilitate data input. In practice, the numerous one-many and many-many relationships within the survey were found to create an extremely complex set of tables and relationships which defeated the overall goal of simplicity and ease of input. So it was decided that *MS Excel* would be used for data entry in conjunction with a coding sheet.

Using rows to represent each survey returned and columns for each question answered would enable a fair amount of analysis to be achieved simply by comparing totals using the *Count* function. More detailed statistical analysis could be performed later by exporting data into *SPSS* if time and resources allowed.

In summary, although the pilot stage did not go into the level of detail recommended by Oppenheim, e.g. piloting the type of paper to be used or the text in the letter of introduction and some errors did still manage to slip through into the final versions, it nevertheless proved to be a valuable fine-tuning process in terms of survey design as well and as a useful trial run for the next stage. The final versions of the respective surveys appear in Appendices D and E.

10 – Survey analysis

88 of the 209 surveys sent out were returned. 3 were deemed ineligible and 3 were received just before submission. The final response rate was thus 39% (*n* = 82). This low rate is probably due to a combination of factors: survey length, subject matter and 'direct mail overload' affecting vets' attention and time. It is worth recalling at this point that INFROSS had a response rate of 42%, which, as Wilson (1994) points out, is well below the critical 50% threshold at which the views of half the sample population can be ascertained. Nevertheless, INFROSS was (and is) still considered to be a worthwhile and valuable piece of research and while this piece of research does not pretend to be on the same scale or level as INFROSS, the results should still be of value to RCVSWL at the very least.

The email survey gained a slightly better response rate (42%) than the paper survey (38%). This may be because of the more 'immediate' nature of email, i.e. messages can be replied to quickly and easily with a click of a button (or, indeed, deleted!). Alternatively, the technological theme of the survey may have appealed to the email user.

Geographical distribution of practices

Table 1 shows the geographical distribution of UK practices alongside that of the practices participating in the survey. It shows that, despite the disappointing lack of responses from practices in certain counties (significantly, Kent - the county with the second largest concentration of veterinary practices in the UK), the percentage of English survey returns (80%) virtually matched the overall number of English practices in the UK (80%). However, Scottish practices were slightly over-represented in the survey (14% against 10% of the UK practice total) at the expense of Northern Irish practices in particular (nil returns). It is unlikely (and further research would be welcomed here to prove or disprove the theory) that Northern Irish practices' experience with libraries and information would differ significantly from, say, Welsh or Scottish practices and all UK practices would in any case stand to benefit from universal service improvements or innovations implemented by RCVSWL or any other organisation.

Practice types and sizes

The proportion of practice types appearing in the survey is illustrated in Table 2 which also includes the estimated proportions from the RCVS Practice database as a reference. It can be seen that the survey exhibited a strong bias towards small practices at the expense of mixed practices (5:3) whereas in reality the relationship is reversed (3:5). The survey also over represented large animal practices (6% versus a 'real' figure of 1%). However, the representative proportion for 100% equine practices is acceptable (4% versus 3%).

The largest practice in the survey comprised 17 vets. However, small practices predominate in the UK. Table 3 shows that practices with 1 to 3 vets make up 62% (28+34) of the UK total while medium-sized practices (4 to 10 vets) count for 36% (21+15), large practices making up the remainder with 2%. The survey over-represented medium-sized practices in the 6-10 vets category at the expense of one man practices but is otherwise an acceptable representation of the actual UK distribution.

It is also possible to combine practice size and type together (Table 4) although this survey's small sample size renders it a theoretical exercise. Future research may be able to establish relationships between practice size and type. Possible avenues for exploration suggested by this table are whether most 100% equine practices tend to be 'one man bands' or whether practices employing 11+ vets are more likely to be mixed animal (as logic would suggest).

Ages and nationalities of practitioners

Table 5 shows that of the 81 respondents who gave their age, the majority could be classified as 'middle-aged': 36 (44%) were between 41 and 50 years of age. 26 (32%) were in the 31-40 category. A minority (9%) of those surveyed were young vets, which, for the purposes of this survey, meant 30 years old or younger. 2 respondents were approaching retirement while 12% (*n* = 10) should be benefiting from the experience and wisdom they have accumulated in their 51-59 years.

Table 5 also shows the actual breakdown of age groups in the UK veterinary population. The fact that the survey population misrepresents significantly the <30 age group is important. For although gender has not been used as a variable in this survey, it is worth noting that 57% of vets in the 30 or younger age group are women (RCVS 1998 Manpower Survey). Overall, women comprise around a third of all practicing vets.

The vast majority (90%, *n* = 72) of respondents were of British nationality even if some preferred to be classed as Scottish! 4 respondents were Irish and 2 were South African. With this in mind, no analyses were performed using nationality as a variable.

Computer usage

All respondents used a computer for at least one work related activity. The type of computer used was overwhelmingly a desktop PC as opposed to an *Apple* or *Unix* device. Laptop use was reported by 17% of the respondents to the question (*n* = 19) and palmtop use 8% (*n* = 9).

The most popular activity was word processing followed by accounts/invoicing and label printing (in that order, see Table 17). The least popular activity was web site design/maintenance followed by veterinary note taking and database searching. The underlying aim in posing this

question was to ascertain computer related ISB. If, for the purposes of this Analysis, email communication, internet searches, database searches, veterinary note taking and multimedia use are considered to be the principal examples of ISB from the activities given, the percentage of ISB activity out of total computer activity can be calculated. The result (29%) confirms that ISB comprised just under a third of all respondent computer activity.

There was no significant difference found between patterns of computer activity by practice type, size or age group.

The Internet

'The biggest waste of time known to man' wrote one respondent about the Internet. But the majority of vets disagreed – 66% (*n* = 54) used the Net for work related purposes and a further 11% (*n* = 9) were using it for non-work related purposes. Of the remainder, there was a small group of vets who were 'Internet converts' (7%, *n* = 6), i.e. they stated they would use it if they had the time. Only 3 respondents had no idea what use the Internet would be to their work and only 1 respondent considered cost to be a major barrier to Internet usage. The remaining 11% of respondents had other undeclared reasons for not using the Internet at present.

Just over half the mixed animal practice respondents (54%, *n* = 15) used the Internet for any purpose as did 69% (*n* = 31) of the small animal practice respondents. All the equine practice respondents in the survey use the Internet and all bar one of the large animal practice respondents.

An analysis of Internet use by age reveals that it is the younger vet respondents who were least likely to be online (3 out of 7), however it should not be forgotten that this category is under represented in the survey. With this in mind, it was found that the 31-40 age group were the category using the Net the most (73%, *n* = 19), followed by the 41-50 age group (67%, *n* = 24) and the 51-59 age group (60%, *n* = 6).

What can be said about vets' ISB with regard to the Internet? How are they finding out about Internet resources? It is difficult to draw any firm conclusions as the 45 respondents who answered the respective open question were able to provide more than one answer and consequently any analysis depends on interpretation. Nonetheless, 3 main sources for Internet information emerge (in rank order, most popular first): *online sources* (comprising surfing, browsing type activities, search engines, newsgroups and mailing lists), *published literature sources* (e.g. adverts, articles in journals or newspapers) and *oral sources* (colleagues and word of mouth).

And once these vets are online, what then? Some degree of caution should be exercised here as some of the categories of online resource provided were interpreted differently by different respondents, e.g. RCVS and *Vet Web* were inserted under two different headings and participants who did not provide examples may also have been thinking on different lines than predicted in the question design stage. But even after looking at the totals for 'frequent' and 'occasional' visits to Internet resources together, no other categories came near to the following figures. 83% (*n* = 45) of respondents who used the Internet for work went to professional institution web sites at least occasionally, and 79% (n = 43) to veterinary information web sites.

With this in mind, the question should be turned on its head and the categories of web sites that were *not* visited considered (Table 6). Significantly, 78% (*n* = 42) of Internet respondents never used library catalogues on the Web. The word 'never' is perhaps too strong here as null responses are included: somebody ticking a 'never' box is obviously making a stronger statement than the person who leaves it blank, so 'do not use' is a more appropriate interpretation. But, semantics aside, the inescapable conclusion is that library catalogues are not being used.

However, it should also be noted that mailing lists are used even less (85% of Internet respondents did not use them) and 74% of Internet respondents never used newsgroups, publishers' web sites or online newspapers in their veterinary work. The low use of online databases is also important as it shows that a veterinary equivalent is needed of the various *MEDLINE* gateways on the Net. Vets do use *MEDLINE* – this was the most cited example of an online database in the survey – but it is first and foremost intended for the medical profession and so its coverage is not specialised enough for veterinary users. Other frequently cited Internet resources were the Ministry of Agriculture, Farming and Fisheries (MAFF) site and the BSAVA web pages. However, no real analysis is possible as responses were sketchy in this section. Accordingly, they are presented without commentary in Table 22 for the reader's interest.

Email

Around 79% (*n* = 65) of respondents had the use of an email address and 69% (*n* = 56) of them used email for work related communication. This figure could grow in time should the 10% of respondents who used email for personal communications only, start using it for their work as well. 64% (*n* = 52) of the survey's computer users can be described as truly 'wired', using both Internet and email to help them with their practice work. An additional 16% (*n* = 13) used email and not the Internet in their work and 17% (*n* = 11) vice versa.

With whom are vets exchanging information via email? The majority of vets who answered the question (84%, *n* = 46) seemed to be emailing other vets in the UK while 69% (*n* = 38) were corresponding with vets working in other countries. Once again, the negative side of the equation is more illuminating (Table 7). Ignoring the red herring of government officials as this would affect mainly vets working for or on behalf of MAFF, it is perhaps surprising that 91% (*n* = 50) of vets using email for their work did not exchange information between themselves and laboratories. Librarians did not fare well either with only 18% (*n* = 33) of the respective sample emailing them. As for clients and practice colleagues, it is more pertinent to deduce that just under a third of respondents *were* exchanging information with these categories of people.

62% (*n* = 35) of respondents who used email for work were communicating with between 1 and 3 types of recipient. 9% (*n* = 5) could be described as 'email addicts' as they were emailing 7 or more types of recipient.

As for the type of information being exchanged (Table 21), leaving aside personal, non-work related information which predominated, clinical and case related information appeared to be the most popular type, closely followed by practice management information. In retrospect, a closed question may have produced an easier set of data to code and so it is advised that the categories in Table 21 are the best of a 'bad job'. The 'invisible college' category, for example, encompasses the exchange of ideas, questions and answers which may or may not be related to cases. The relatively low amount of research information exchanged is noteworthy. Generally, it can be argued that email use is in its infancy in terms of ISB as vets gradually experiment with it in their professional lives.

CD-ROMs

Of the 80 respondents who answered the question on CD-ROM usage in the past month, 12.5% (*n* = 10) indicated that they did not use CD-ROMs at all while the majority (40%, *n* = 32) had not used a CD-ROM in the previous month: 19 of these were Internet users, 13 were not. The remaining 38 respondents were hardly heavy CD-ROM users as the majority (72%) had used at least one on 1 to 5 occasions and 25% on 6 to 10 occasions. Only 3 respondents had used CD-ROMs 15 or more times.

CD-ROMs were used mainly for 'staying current' (presumably as part of the vets' CPD requirements) by 78% of regular users. This compares with 55% of regular users consulting CD-ROMs to answer patient care questions and 36% consulting them for personal research purposes. It was also found that regular CD-ROM users overwhelmingly (89%) preferred to search CD-ROMs by themselves rather than delegate their searches to somebody else.

Vetstream dominates the veterinary CD-ROM market. Looking at the CD-ROMs used in the previous month, 20 respondents used the *Vetstream's CD-Canis* while 12 used *CD-Felis* and 5 *CD-Equus*. A further 6 respondents stated 'Vetstream' which can be interpreted as referring to the former product family or to the previous incarnation of the company's products which required a stand-alone *Vetstream* multimedia terminal in which the CD-ROMs were incorporated. 8 respondents used *Vision*. The response for *MEDLINE* (3) is probably not accurate as more respondents may use it via one of the numerous Internet gateways and thus consider it to be an Internet resource rather than a CD-ROM or database. Other CD-ROM products (drug compendia, proceedings, *Encarta)* were hardly used.

Reasons for non-use were explored amongst the 42 relevant respondents. Problems were encountered with ranked responses which mean precise answers cannot be given. However it was clear that the 4 major explanations for non-use were: lack of easy access, lack of time, lack of equipment and uncertainty over which databases to use. Reasons which were not considered important (and scored equally lowly) were: cost of searching, preferring others to search, dislike of computers, wrong kind of information, and no access to journals once references found.

Computer training needs

Unfortunately, due to a structural error that slipped through the Pilot Stage unnoticed, only the training needs of email users was measured. Just over 50% of these did not complete the question – something that could be interpreted as the measure of confidence these respondents had in their own computer skills. The most common training need expressed by the remainder concerned Internet skills – how to get the most out of the Internet through better searching etc. There were some eclectic responses as well which indicated an underlying need for other special kinds of training. For example, 'How do I persuade my senior partner to use them [computers]?' or 'Don't know enough about it to answer!'

Preferred communication medium

The closed question relating to this issue did not generate an entirely satisfactory set of data either as 16 (20%) of the 79 respondents gave multiple answers when only one response was required.– perhaps due to a confusion caused by the fact that some previous questions had asked for one response only while others had allowed multiple responses. When faced with such a data set, the researcher either has to ignore the erroneous responses or compensate for them in some way, e.g. by apportionment. In this particular instance, the rank order of preferred media is unchanged by using either strategy: (favourite first) email, paper document in the post, Internet site, fax, phone, floppy disk and audio cassette/other. Note that no distinction was made between different kinds of phone. Fax and phone are almost interchangeable in the rankings.

Further analysis is needed as non-email users' responses are jumbled in with email users' responses. It is not surprising that for the 18 respondents who stated that neither they nor their practice had an email address, information in paper document form through the post was the preferred medium followed by fax and phone. On the other side of the coin, stripping out the non-email users' responses to look at the email users' preferences makes Internet sites the second favourite medium, relegating paper documents down to third place.

Respondents' preferred means of obtaining information when working away from the practice was also explored in order to gauge the use of portable communication/information devices. It should be noted that the question was interpreted as applying to vets working at home as well as on call and that more than one response could be given. Out of the 61 respondents who answered the question, 5 stated they would wait until they returned to the practice to get the information they needed. 15 (25%) used mobile telephones. An additional 31 vets (51%) said they used the telephone, which may or may not include mobile equipment. Interestingly, 7 vets stated they used books. Laptop use was reported by 8 respondents (13%). Pagers were used by only 3 respondents.

Preferred information sources

Analysis of respondents' preferred information sources was intended to be the crux of the survey stage and the results provide a much needed dose of reality. It was pleasing that there were no null responses in this section and it is fairly safe to assume that 'normal' use is being measured, as opposed to 'one off' use. Tables 8-10 show that however many vets might be using the Internet and/or databases, these kinds of sources are not high up *at all* in the overall scheme of veterinary information seeking. Journal articles, textbooks and conferences form a powerful triumvirate of information sources for drug, diagnostic and therapeutic information. Another point to retain is the low prominence of abstracting/indexing sources and annual reviews.

Examining Table 8 for preferred drug information sources, it is worth noting the importance accorded to the principal example of veterinary ephemera - promotional literature – with 77% of respondents using it. It is less surprising that company (i.e. pharmaceutical company) representatives and practice colleagues were also considered to be important sources for drug information as they have direct, practical experience of a product, albeit with a slightly different viewpoint. On reflection, the low use of laboratories as a source of drug information is to be expected, as they only test samples on the basis of instructions from their veterinary clients and will not be looking for adverse drug reactions etc. The relatively low use of databases (26%) and web sites (24%) is probably a reflection of the products on offer and, in the case of web sites in particular, of a lack of credibility (e.g. drug information sites that are unbiased and peer-reviewed).

Table 9 shows how primary information in the form of human contacts (other vets and practice colleagues) comes into play at the diagnostic stage of the information cycle. 40 of the 65 respondents who ticked ‘other vets’ (62%) had also indicated they exchanged information by email with ‘other UK vets’ in a previous question (for the sake of completeness, that leaves 6 respondents who, it follows, either used their UK colleagues for other kinds of work related information or did not rate the information they provide!). Note too that journal articles really do dominate this category of information with 95% of respondents using them to meet diagnostic information needs.

Table 10 tells a similar story to Table 9 except that journal articles and textbooks are equally important. But the importance of peers is evident as is the rise up the chart once more of company representatives. This in part follows on from their position in Table 8 as drug information can be considered to be a subset of therapeutic information. Perhaps respondents were thinking about other veterinary suppliers here, i.e. those providing monitoring equipment, surgical aids etc. The importance of training courses and workshops is also recognised by respondents for both diagnostic and therapeutic information.

Characteristics of information source use by practice type

The next aspect to consider is the pattern of information source use by each practice type (Tables 11-13). This particular piece of analysis is hampered somewhat by the low response rate to the survey and the small proportion of large, equine and poultry practices means that they have been omitted from the analysis that follows. It is nonetheless a useful exercise for small animal and mixed practice type analysis. Attention should be paid to large differences between the percentage figures for each information resource. For example, using Table 11, it can be argued that the respondents working in small animal practices were using practice records as an information source for drug information to a much greater extent than their peers in mixed animal practices (76% of small animal practice respondents used this information resource as opposed to only 32% of mixed animal practice respondents). A similar relationship exists for ‘other vets’ as a resource (64% small animal use versus 39% mixed animal use). Small animal practice respondents were also using references and abstracting/indexing services much more than mixed animal practice respondents but these are still minor resources in terms of information seeking. On the other hand, mixed animal practice respondents were making greater use of encyclopedia and compendia than their small animal practice counterparts.

Two important conclusions can be drawn from Table 11. Firstly, that small animal practice respondents were using electronic information resources for drug information to a greater extent (+17% in the case of databases) than mixed animal practice respondents. Secondly, that while the finding from Table 8 that journal articles were the preferred resource for drug information still holds, it can be seen that textbooks, promotional literature and company representatives were

of equal importance to mixed animal practice respondents and conferences were less important to this practice type than Table 8 would suggest.

Moving onto diagnostic information (Table 12), the first general impression is that there is a much more defined ‘information use hierarchy’, so to speak, on the small animal side than on the mixed animal or, in other words, mixed animal practice respondents were making greater use of a wider range of resources for this kind of information than their small animal practice peers. The last sentence is actually common sense on reflection – the wide variety of animal species seen by mixed animal practices with all their respective conditions must make calls on a wider variety of diagnostic information sources than is needed for a small animal practice. And it is this variety that may explain the greater use by mixed animal practice respondents of particular information resources such as training courses/workshops (+11%), practice colleagues (+8%) and laboratories (+13%) to help them cope.

Once again, small animal practices made greater use of databases for diagnostic information and abstracting/indexing services (33%:11% and 47%:36% respectively) However, there was a roughly similar use of Internet sites, albeit low in priority. One curiosity is that the small animal practice respondents reported significantly greater use of promotional literature (+23%) for this type of information. As suggested previously, promotional literature could be being used in conjunction with other information sources or, indeed, data sources such as diagnostic apparatus.

This reliance on promotional literature (+24% on this occasion) can also be found in Table 13 which examines practices’ use of therapeutic information sources. Training courses/workshops featured more prominently in mixed animal practice respondents’ routines (79% versus 67%) as did the use of practice records (46% versus 31%). On the other hand, current awareness publications, personal notes/files, references/citations, databases, abstracting/indexing services and laboratories were all used more (at least +10% for each one) by small animal practice respondents. When comparing the two distributions, it can be seen that the small animal column has a much more even distribution than the mixed animal column which indicates that the latter type of vets were using a small variety of resources for their therapeutic information needs.

Finally, the average number of resources used by mixed practice respondents was 9 and there was an average of 3 sources used for each information type. For small practices, the overall average was 17 with an average of 6 information sources used for each information type. If all practice types are included, the average number of resources used is 7. Once again, these figures should be treated with caution because of sample size and response rate.

Characteristics of information source use by practice size

Tables 14-16 breakdown information source use by practice size. The importance of conference proceedings to practices should not be overlooked – at least rank 3 in virtually every column of each table The second observation to make is the apparently low use of electronic resources by 'super' (i.e. 11+ vets) practices, especially use of databases. This practice type in the survey did not use any abstracting/indexing services or annual reviews for any information type and reported very low use of references/citations. Further research is clearly needed here to confirm or deny these findings.

For one vet practices, a clustering effect can be observed, especially in Table 15 (diagnostic information) and Table 16 (therapeutic information). That is, a small group of sources were used consistently more than others: journal articles, textbooks, conferences, other vets and conference proceedings. Only when drug information was needed (Table 14), were additional sources used to a similar extent: promotional literature, company representatives and personal notes/files. As for small (1-3 man) practices, it is fair to say that they generally used a wider variety of sources than other size practices.

Medium sized practices in the survey rated practice colleagues highly - the most useful information source for therapeutic information along with textbooks and second most useful source for diagnostic information. It is expected that this trend would also apply to super practices but their representation is too small in this survey to be certain.

Keeping up-to-date

The question 'how do you keep up-to-date?' was put to respondents. Various interpretations of the results are possible, in part due to the fact that an open question generates a varied set of data (Table 18). Journals appear to be the singular most used source for keeping up-to-date. However, it can be argued that there are negligible differences between meetings, courses, seminars etc and consequently it is *this* kind of information source that is the most popular. Certainly, there is an overall balance between the use of published and oral sources.

Responses such as 'CPD' and 'reading' conceivably include both journal reading, books and courses and so cloud interpretation It is clear, though, that electronic information sources (and possibly one to one sources as well) were not regarded as being important, despite the fact they both offer the possibility of being the most current information sources of all.

Emergency sources

Respondents were asked what they considered to be their optimum sources of information in emergency situations. Table 19 confirms that the humble book (textbook or reference) was the main life support system (sic) with 45% of responses followed by practice colleagues with 18%.

There is really little to choose between the remainder. Electronic information sources are clearly not regarded as being suitable for the job.

Barriers to IU

Time, cost and inadequate information skills training (in that order) were regarded as the main barriers to IU. Time barriers were twice as significant for respondents as cost barriers. This response was anticipated and so an additional question gave respondents the opportunity to consider three possible solutions to the time problem, extracted from the IS literature. The results show a marginal preference for the 'circuit librarian' idea (*n* = 13) over 'onsite information intermediary' (*n* =11) and 'personal Intermediary at information service' (*n* = 11).

However the largest response was comprised of don't knows, no preferences and null responses (48%, *n* = 39). This can be interpreted in several ways. Firstly, as a genuine expression of ignorance. Secondly, as a passive response, e.g. it is not for me to know the answers, others must present solutions to me. Thirdly, as an acknowledgment that there may not be a definite answer, with it being left to the individual vet's discretion to decide what action to take (if any) about time pressures.

It should also be noted that respondents were given space to suggest their own ideas and only 6 chose to do so. Of these, one commented that none of the suggested solutions would save vets' time, while another considered lack of time to be a false argument, commenting: 'if you want to, you can always find the time!!!' One vet suggested audio tapes while the remainder thought that the Internet could provide the answer via a combination of full-text journals and dedicated veterinary search engines and/or web sites.

Problems with information sources

71 respondents answered the question on problems with information sources. The results are shown in Table 20. It should be noted that there is a degree of overlap between the categories. Nonetheless, it is clear that currency of information was the most pressing problem with vets having to grapple with out-of-date information. One respondent pointed out that rapid changes in medicine and therapeutics, especially in disciplines such as anaesthesia, are rendering textbooks out-of-date as soon as they are published. However, problems with availability and content are also of concern. The former category encompasses occasions where colleagues or referral vets are unavailable at the time when the information need is most urgent or where books have been left at home or the information is at another practice in whatever form. Content problems refer to poor coverage of a topic, lack of detail on rarer topics or conflicting/biased advice.

The fact that the cost of information does not appear to be a significant issue is worth retaining as is a particular example of a design problem – poor indexing. This refers not only to indexing of documents for a database or search engine but also for paper journals. Finally, at the risk of being provocative, one interpretation of Table 20 may be that the respondents were exhibiting a lack of information skills.

Evaluation of information

What criterion or methods do vets use to evaluate the information they retrieve? 'Credibility of source' was by far the most significant criterion used with 40 out of 76 respondents (53%) allocating it first or second position out of the list provided. 'Personal experience' came second (50%, *n* = 38) and 'discussion with practice colleagues' in third place (33%, *n* = 25). 'Methodology used' and 'consultation with professional association' were hardly used as evaluating criteria.

Veterinary libraries

55% (*n* = 45) of respondents used a veterinary library and for 68% of these, RCVSWL was the most important library. No other veterinary library scored significantly. Of the 37 respondents who did not use veterinary libraries, 57% (*n* = 21) were Internet users, although that is not to suggest cause and effect. The opportunity was taken to ask these 37 non-users what (if anything) would prompt them to use a veterinary library and the majority of responses (43%, *n* = 15) stated 'improve access via the Internet'.

Veterinary libraries were primarily used for article/reference chasing (43% of the 69 responses to the question). The more general literature searching activity accounted for a further 19% of responses. Book or journal loans (26%), was thus not the principal library service used by respondents. Library users were given the chance to make a 'wish list', specifying anything they felt they needed from a VIS but were presently unable to obtain. 30 respondents gave a response. 10 felt nothing else was needed. 5 did not know. One user wanted better photocopies for illustration reproduction. One wanted access to theses. Another wanted training and another a personal contact/researcher. However, the majority of users (11), like the majority of non-users above, were keen for Internet service provision to be developed, in particular access to the full-text of veterinary journals online. The response below is a good example:

> The Internet and online information sources are a lifeline for practitioners like myself practicing in a remote area. It would be most useful if we could access the RCVS library resources on-line and download entire articles, reviews etc.

Finally, a 'safety' question concerning the last use made of a veterinary library was inserted in the veterinary library section to make sure that all IU had been catered for. This revealed one

activity that had not been previously considered - a minority of respondents were using veterinary libraries as a prelude to making textbook purchases for their practices, seeing what was available or current before making a final purchase.

Rejected data

Data obtained from two questions was not analysed. Question 14b did not produce a valid or useful data set. A closed question containing named items may have produced the desired result. Question 32 was affected by an error in the survey design which meant that only veterinary library users could answer the question. Also in retrospect the question was too general to be answered satisfactorily.

11 - Interview Analysis

This section considers the main points that arose out of the interviews undertaken for this project. By interviewing vets, it was hoped that qualitative and more detailed data would be obtained on issues that were touched on in the survey or omitted due to lack of space, e.g. cost factors. The interviews should therefore be regarded as complementing the Survey.

At this point, the interview stage itself must be put into context. It would not be accurate to say that the interviews took place as soon as all the surveys had been returned, as some were still being returned around the beginning of October. Therefore, a rough and ready appraisal of the main themes arising from the survey returns was made in August and these were used in combination with the Aims and Objectives of the project to produce an interview guide or prompt sheet so that all the interviews covered roughly the same areas of discussion. However, as indicated in the Methodology section, the interviews were intended to be *semi-structured*, explaining why, on reading the transcripts (Appendix G), some of the interviews seem to follow their own unique paths. Indeed such diversions were encouraged rather than stifled, both to try and 'open the interviewee up' and also in the hope that they would lead to a mutually beneficial (in the research sense) point. It must also be said that they made the interview process more interesting for the interviewer and (it is hoped) for the interviewee and reader! Finally, it should be added that continual intervention or interruption in order to adhere to an entirely artificial schedule or inflate the interviewer's ego defeats the whole process – after all, the object is for the researcher to learn from the subject and gather data.

At what price objectivity and replicability are compromised by the semi-structured interview is a whole area of research in itself. This discussion will attempt to extract the nuggets of opinion from the pool of words and place them in their proper light. Note the referencing convention used in this section: (1:100-105) means Vet interviewee No.1, lines 100 to 105 in the transcripts (Appendix H).

The RCVS Wellcome Library

Extracting views and opinions on RCVSWL was an essential part of the interview stage. In fact, the interviews became more like focus groups when the library was discussed with many 'what if' scenarios thrown in for good measure. The views obtained can be classified under various headings, although it will be seen that there are common themes that run through each heading (e.g. Internet).

Services Generally, RCVSWL services were regarded positively. The staff were seen as helpful in that 'they're always prepared to beaver off and find other things' (1: 6-7) and 'you can get just about anything' from them (2: 335). Delivery times of items ordered were good (1:6) and information about costs of items/services was upfront

(1:7). Some suggestions for improvement were voiced: when a user has ordered a batch of articles, for example, they could nominate a delivery option: piece meal (i.e. as and when they arrive) or in one batch (1:250-255). The latter would simply require the library to wait for all articles to arrive before sending them onto the vet. Finally, V6 would like to see an out of hours service (6:1617-1619).

There was mention of delays for journal loans on account of there being long queues for certain titles (1:12-13) and postal book lending was seen as inevitably 'unwieldy' by the same interviewee (1:14). V5 thought a postal system was generally too slow and consequently information requested '…loses its relevance very quickly because cases move on' - an Internet equivalent would be better (5:1297-1299). V7 shared this opinion, stating that the principal reason for *not* using the postal service is convenience rather than cost, he was of the opinion that being able to see the abstract on screen and then request the full-text if appropriate would be a better system and he would be prepared to pay a premium for it (7:1984-1988). The need to obtain an article there and then rather than waiting for the postman to come, obviously relates to a vet's attention span more than clinical urgency. As V4 puts it, '…you're thinking about it and you want to study it and…if I can sit in front of a computer and look at it, then I do' (4:1018-1019).

V4 questioned the need for textbook loans altogether, adopting a binary view of buy or not buy, as items for loan are 'usually out of date' (4:1048-1049). It would have been interesting to discover the library collection forming the basis for this observation.

V6 was fundamentally anti-RCVS and thought the library charges for photocopying and sourcing articles are very expensive compared to his old university's veterinary library (6:1574-1575), however that was two to three years ago when he was completing a Ph.D. (6:1594-1595; 1605). He also criticised RCVS (and the library?) for delaying answering the telephone (6:1620-1621).

Collection The interviews generally confirmed the view that RCVSWL was used as a back-up library, providing items that are used '…once in a blue moon' (1:28) and consequently would not be purchased for a practice library.

Catalogue Some interviewees were asked about the new RCVSWL *Web-Cat*. V2 was aware of it (2:608-611) but had not used it. V3 and V5 were not of aware of it (3:647-650; 5:1278). V4 had tried to use it but was unsuccessful as he did not have the appropriate user name and Personal Identification Number (PIN) (4:996-1000). V6

was not sure if he had been notified of his PIN (6:1731). This indicates a need for ongoing publicity to promote the existence and benefits of such facilities.

Publicity This was an aspect of the library that needs the most attention. It should publicise itself (5:1470) and at least 'a bit more' than it does already (2:605). 'I don't know what's available', complained V6 (6:1708-1709) , adding later that he thought RCVS and the library was very poor at marketing itself (6:1716). The claim was made that 'a lot of people aren't aware of what a good library it is' (2:333) and that many of the people supervised for Certificates 'need a lot of encouraging' (2:321-322) to use RCVSWL to the point that 'they're a bit nervous about actually using it' (2:326). Publicity extends to contact information as well: V6 believed he would use the library 'a lot' if he could communicate with the librarians via email about his queries (6:1757). The point here could be that such facilities may exist but are not adequately signposted, e.g. instead of a list of RCVS email contacts, a universal email such as *libqueries@rcvs.org.uk* may be more appropriate.

Promotion Following on from publicity, interviewees' opinions were sought on the best vehicle for RCVSWL to use to promote itself. The idea here would not be some kind of advert but an article promoting, for example, effective exploitation of information sources in which reference to RCVSWL's services could be made. V1 and V4 believed *In Practice* would be the best forum for such an article as it is actually read by practitioners (2:614-616; 4:1206-1210). V1 disagreed with this as *In Practice* is not peer reviewed and that would be essential criterion for such an article. She was also uneasy with the whole idea, preferring information skills to be formally taught (1:278-286).

Access Improving access to the library via the Internet was seen as a positive step to take – '…a different ball game completely' as V3 put it, working in Scotland (3:827-828). The section below on the role of RCVSWL with regard to the Internet explores this further.

Training There is a definite (market) opportunity for RCVSWL here. Not just training on how to use and access the library (2:606) or information skills (1:258-261) but also advanced training such as interactive CPD courses, online (3:831-844). The question here is whether the library is able to undertake such a role when other sections of the RCVS might be expected to assume it, or indeed other organisations.

Use One interviewee indicated a use of the library that is often overlooked – current awareness of published materials (7:1905-1906). That is to say, using the library

not just to become acquainted with the latest research (in whatever form) but also to ascertain what the latest textbooks and multimedia are in a given area and then either borrow there and then or buy them on return to the practice, a kind of trial purchase. There could be an opportunity for a promotional tie-in with publishers in the light of this library use, e.g. discount of purchase price for library users.

Literature

V3 and V5 were the most critical interviewees in terms of journals subscribed to (*Vet. Record* and *JSAP* in particular), considering their content to be more and more irrelevant to the vet working in general practice (3:752-759, 5:1282-1286). Subscriptions were also seen to be expensive (5:1385). V5 considered *In Practice* to be useful but it seems that for these vets, the problem of sorting the relevant information from the irrelevant is just as much an issue for veterinary journals as it is for the Internet (3:740-742, 5:1396-1397).

V3 preferred the *BSAVA* manuals to the same association's journals and liked radiographies as well (3:747-749).V5 also reinforced the survey findings on the importance of veterinary ephemera in that he considered pharmaceutical company literature at times to be a better source of information than journals (5:1397-1403).

Electronic veterinary information

CD-ROMs *Vetstream* CD-ROMs came under the spotlight in the course of three of the interviews and with good reason: they are, after all, the best examples to date of multimedia databases aimed specifically at the practicing vet working with dogs, cats and/or horses in particular. Opinions were negative on the whole: V3 found them to be expensive (3:771-774); clumsy to navigate through (3:770-771) and conservative in that they do not go beyond the standard techniques that most vets know anyway (3:768-770). V5 obviously appreciated *CD-Canis* and *CD-Felis* as he works essentially alone in a small animal practice and reasoned that the kind of information included on them obviated an online version (5:1503-1508). He did, however, acknowledge their limited scope/coverage (5:1286). V4 looked at *CD-Equus* and found it to be expensive and, once again, not particularly detailed compared with journal articles (4:1056).

V3 found the data compendia, formularies and *GTI –Vision* that are now available on CD-ROM to be more useful (3:780-783). V2 also signalled an information need fulfilled particularly well by CD-ROMs – the communication of conference proceedings (2:485-486).

Are CD-ROMs threatened by the Net? On the basis of these interviews, the answer

is in the negative. Although V3 was pro-Internet (3:789-790), V2 preferred CD-ROMs as she found that she wasted a lot of time using databases on the Net (2:495-496). V5 saw no need to tie up his phone line when he had perfectly adequate information on CD-ROM (5:1507-1508). V6 had suffered slow download times when online (6:1713-1714) which made him appreciate CD-ROMs for their accessibility (6:1853-1854) and portability (6:1850) as well as the functionality of certain interfaces (6:1843-1847). He was concerned about general image quality (6:1876-1878) though. V4 thought that CD-ROMs would replace paper journals, something that would facilitate indexing and searching (4:1062-1065). V1 was not impressed with the CD-ROMs she had seen on account of their basic level (1:136-138) but for her it is books that provide the viable alternative and not the Net (1:140-141).

Internet

Although fully aware of the Net's potential as an information resource, it is fair to say that all the interviewees were at least frustrated by it in its current state, if not openly hostile. V1 saw an important role for the Net thanks to its speed and immediacy as the profession's preferred internal publishing/communication medium for position statements and professional issues (1:190-192). Speed of publication was also a key factor in V2's appreciation of *FEMS* online as it enables current awareness (2:573-573). The Internet's immediacy was valued by V3 too as it means there is a theoretical possibility of being able to satisfy any information need instantly (3:684-685).

V3's experiences with the Net and his practice web-site were probably the most positive of all the interviewees and show how it can facilitate a boundary less exchange of useful information (3:796-814).

Role of RCVS

The interviewees clearly recognised that electronic information could be the way forward for future veterinary information provision but at the same time they were fully aware from their own experiences with CD-ROMs and the Internet that fundamental problems exist that need to be resolved before online information becomes part and parcel of everyday practice. As a consequence, some had resolved to use print information wherever possible, others were impatient for changes to take place. The question should be asked therefore: is there a role for RCVS and its library in electronic information provision or is it solely the concern of private enterprise?

Interviewees were presented with a scenario whereby the RCVS library (in some form or other) would assume an Internet filtering role, indexing good veterinary related sites on a searchable database. This corresponds to V5's wish for an online

reference library where he could '…fiddle about and maybe find something a but better..' (5:1299-1230). V1 was in favour of this kind of model (1:39). V2 strongly believed that such a selection process should be peer-reviewed (2:595-596). V3 wanted an online hierarchical thesaurus (like *MeSH*) in preference to an index when investigating his subjects of interest (3:664-671).

The potential appeal of Selective Dissemination of Information (SDI) services via email were explored with some interviewees. Here the library would 'push' information (e.g. abstracts, articles or web site addresses) directly to the vet's email inbox matching predetermined criteria. It was an idea that found favour with most interviewees (1:48-57), (3:659), (5:1311), (7:2078-2080). V2 saw such a service as complementing her normal browsing activities in a veterinary library (2:363-368). V4 was unsure. He questioned whether he would be able to specify useful criteria on a subject without being bombarded with 'junk'.

The idea of accessing the full-text of journals through the RCVSWL web site was welcomed across the board (1:39), (2:361), (3:636-644), (4:1015), (5:1297-1299), (6:1768), (7:1984-1988).

Non-textual information

The aim in exploring this kind of information was to determine what vets were doing in this field (if anything) and so determine if there was a demand for digital images before considering if the library has the equipment, material and know-how to deliver them. It also indicates a wider consideration of the library's remit, possibly into areas of information consultancy or, at the very least, sound advice on the issues surrounding use of this particular type of information.

Images Some interviewees' practices have been experimenting with digital images but problems with size (in memory terms) and consequent slow download times in transferring them between computers, even on ISDN lines (6:1884-1885) mean that at present digital image exchange is in its infancy. V1 sees it as peripheral, a 'luxury' (1:204) but admits that it would be useful to be able to store photographs in her computer (1:210). V7 identified a particular case when a high-resolution microscope image downloaded from the Internet would have been ideal but admitted this was not a common need (7:2113-2118).

One area where digital images are already being used is on the client relations side: V6's practice was using digital images inputted via a scanner for DTP purposes to produce some impressive client information sheets (6:1885-1890). V3 described exchanging photographs with clients and a case in which such a facility would have been good public relations (PR) (3:861-870). V2 has not been

impressed with the quality of images downloaded off the Internet and so still exchanges transparencies. She also raised the issue of electronic tampering which is considered below (2:521-524).

X-rays The concept of digital x-rays had already been explored by some practices interviewed. It is obvious that x-ray archiving is a real headache for practicing vets not least due to the density involved in storing plates (1:216, 4:1181-1185) but one that cannot be ignored as the x-rays may ultimately be required in court as vital defence evidence in negligence cases (1:219). This fact alone raises issues to do with admissibility which have yet to be overcome – can digital x-rays be stored in tamper proof file formats, for example? (1:220-222). The other restraining factor at present is the quality of digital x-ray definition (1:214, 4:1172-1176).

However, V4 is already able to exchange bone images in JPEG format via email with a referral practice (4:1164-1168) and, as he pointed out, successive equipment upgrades over a 10 year period will usher in digital imagery and x-ray capture technology anyway. V3 was also keen to start experimenting with digital imaging (3:874-881).

Videos Training videos/CPD videos were generally regarded as unimportant, peripheral (4:1189-1191) sources of information. The stock currently available for loan from veterinary libraries such as RVCL was criticised for being out-of-date (7:2129-2130). Arguably, the training value of videos has been superseded by the potential offered by interactive multimedia and online products and it is this form of audiovisual aid which seemed to appeal (3:832-844). It was also suggested that pharmaceutical companies now dominate veterinary video production (2:539), presumably seeing it as an effective, non-ephemeral promotional medium. In terms of RCVSWL service delivery, it is perhaps more appropriate for RVCL to provide this kind of information as they already have a large video loan stock.

Email

Email appears to be becoming an integral part of the interviewees' professional lives. Despite V5's attachment to the fax machine (5:1337-1338), he believed that email use rises exponentially once it is used fairly regularly (5:1326-1330) and becomes part of the daily routine (5:1334-1336) as it has most definitely done for V6 (6:1753-1754). V6 was of the opinion that email use saved paper and that having an email address was a vital part of client relations (6:1736-1737).

One of the fascinating findings, apart from the future role of email in the non-textual information provision/exchange considered above, was the use of flatbed scanners to exchange document

images. V2 talks of a virtual vet community in which meeting proceedings and journal articles are exchanged via email and post (2:409-415). V3 exchanged non-clinical information with his brother (also a vet) as well as maps and CVs with prospective visitors (3:848-855).

Intermediaries

V4 was happy to perform his own information searches (4:1133-1134) as was V2 (2:471-472) although she believed a non-vet, scientific or medically qualified intermediary would be the most objective kind (2:124-132). On balance, the interviewees were not disinclined to delegation. V3 would gladly delegate his searching to a veterinary nurse, seeing it as an opportunity for their development as well (3:888-892). He also believed that formal information training would be useful but perhaps not essential (3:895-899). V6 also proposed that veterinary nurses could undertake searches, not just to alleviate boredom but also to act as kinds of 'relevancy filters', reducing the number of articles that needed to be sifted through by the vet (6:1897-1899). This reaches the nub of the intermediary issue – how much delegation or independence is allowed? V7 saw his potential intermediaries (veterinary nurse or librarian) as 'gophers' – 'go for this article, go for that article' rather than as researchers who would discover information on a subject (7:2066-2079).

V1 was in favour of intermediaries with the proviso that they were not vets (1:115-116). She believed vets to be unobjective (1:111-115) and egocentric (1:130-131); both barriers to effective ISB. For her, it was clear that a librarian with a scientific/medical qualification would be the ideal researcher (1:120-127). Finally, V5 was undecided. Price, speed and quality factors would have to be right in order for him to use an official 'broking' service provided by a library (5:1306-1307). V5 also brought up the classical argument about information intermediaries – their future is threatened by information systems:

> '…the cleverest system in the world doesn't need you there, does it? It shouldn't need…if the system is set up cleverly enough, then the filtering is done by the person who requests the information.' (5:1546-1548)

The defence to this attack is that it is the intermediary who sets up, monitors and promotes the system via training and publicity, thus moving from the middle of the communication channel to either the front (delivery) or back (sourcing) end. This in part explains why questions on publicity were asked during the interview stage.

Information related costs

Calls Despite the recent press attention on the comparatively high cost of using the Internet in the UK which pointed out that UK users have to pay local call charges whilst online whereas USA users have unlimited access in return for a flat-rate

monthly fee, call charges were not perceived as a major cost or barrier to Internet use (1:143-145; 2:380-384; 3:792; 4:1142-1148; 5:1428; 6:1833-1835; 7:1995).

However, it is suggested that when actually engaging in ISB activities, as opposed to retrospective analysis in an interview situation, the notion of cost can have an effect on behaviour. This point was reinforced in V2's expression of preference for browsing paper journals rather than following hyperlinks on the Web as the costs mount up (2:371-373). This statement seemingly contradicts the earlier assertion that call charges are not seen as a problem. The point here is that flicking through a journal incurs no additional cost to the original subscription price except in terms of time spent. On the Web, even if the e-journal offers free access, the vet is being charged for time online on top of the notional cost of his/her own time (or man hours) and as V2 points out later (2:494-496), it is very easy to spend a lot of time on the Net (browsing) and the notion of a meter clocking up the charges must always be in the back of the mind. The vet could become just as absorbed with a print journal but at least would not be incurring an extra charge. So the circle can be squared by focusing on time costs rather than actual costs, by asserting that for vets, time equals money and time spent online is twice as expensive.

Journals & CD-ROMs

Subscription prices have been rising above the rate of inflation for the last few years. That fact naturally forces the subscriber to focus on content, comparing one source against another to determine if savings can be made (content will be addressed in another section). V3, for example, described how two or three 'good textbooks' can be purchased for the price of one *Vetstream* CD-ROM about which he had certain reservations (3:772-774). V5 begrudged his subscriptions on account of their expense and irrelevance (5:1383-1392). Note that this price sensitivity only seems to apply to journal and CD-ROM subscriptions – the vets were not weighing up the cost of a month's Internet phone bill against the price of a new textbook, for example.

Subsidies

Should RCVS be subsidising information related costs in the same way that the NHS is subsidising doctors? The 'Desk-Top Doctor' initiative aims to provide all 30,000 British GPs with PCs so that email can be used to reduce unnecessary appointments and simplify routine tasks like repeat prescriptions (Woolf, 1999). Examples given in the interviews were Freephone numbers or a private leased-line network connecting all vets to the Internet. There was a mixed reception to these kinds of proposals and mixed opinions about the current fees and value for money from RCVS in general.

V5 was resolutely against the idea, believing the profession to be sufficiently wealthy for vets not to have any concerns in this area (5:1433-1434).

V1 saw them as being a 'nice add on' and nothing more as it was going beyond RCVS's remit and there are more important things to address. She also thought that RCVS fees were too low and that this has been leading to compromises being taken in key areas (1:151-156).

V7 looked at the issue from another direction, preferring to see a consumer model where vets only pay for what they use (7:2003-2005). This 'pay as you go' model also found favour with V6 as a potential charging model for online full-text articles (V6:1902). This was echoed in V3's idea about an 'Internet membership' of the RCVS whereby, in return for a flat fee, the member would receive subsidised access to online databases and subsidised call charges. The Freephone number idea was also welcomed by this particular vet who otherwise questioned whether he was getting value for money from his subscription (V3:819-825).

Absorb or pass on costs?

The reason why subsidies for information related costs had a muted response can perhaps be found in V6's interview. It is easy to overlook the economic realities of veterinary work when discussing veterinary information. Practices, although existing for the public good, are businesses after all. This was reinforced by V6 at length when he set out the dilemma his practice faced with CPD (6:1604-1698). Although he was essentially discussing the costs of veterinary education and not veterinary information, the costs of the latter have to be factored in as well. Essentially his point was that it was hard to increase fees in an already competitive market for veterinary care to cover the costs of CPD and that they ended up being taken out of practice profits which became a disincentive to invest in CPD and so forth. CPD was harder to market as a benefit to clients than a new piece of equipment, he said, particularly when the claim of a higher standard of patient care than other practices could not be made without revealing cases of gross misconduct in rival practices who continued to charge high fees. Nor could other products be used to cross-subsidise CPD costs as clients would soon spot higher mark-ups. Here, V5's comment about client expectations can be brought in: clients hope to '…get a million gigabytes of information out of you because they think you have that…', without being 'surcharged for the information you don't know' (5:1526-1529).

In this context, information costs can be seen as an unwelcome additional expense that are hard to justify to the client when considered in isolation. What is the way forward? Clearly, subsidies for CPD from the RCVS for

smaller practices rather than subsidies for information costs could be beneficial in parallel with the stricter vigilance of professional standards suggested by V6 (6:1687-1689). However, low cost delivery of CPD via remote learning methods is crucial. If delivered via the Internet then the demand for quality online information noted in this project could be met at the same time. A vet, perhaps using a kind of RCVS sponsored interactive tutorial suggested by V3 previously, could access a full-range of peer-reviewed, full-text support materials (journals, books, book chapters etc) remotely from the RCSVWL web site with comparative ease without having to lose a whole days work to travel to a training centre. The package could be 'all-in' or pay as you go to enable vets to control expenses incurred. However, it is also suggested that establishing and maintaining long-term relationships with clients to ensure repeat business is just as important.

Profiles of ISB in practice

Not good but good enough?

Some measure of the ISB and the underlying information skills of the interviewees was attempted by asking interviewees about their own information systems. A very subjective process, it is true, and futile in the sense that the vets must have had a reasonable competency information wise in order to be practicing. It should also be pointed out here that a disorganised desk is not necessarily the product of a disorganised mind and the vet should be judged on the basis of standards of care and client satisfaction achieved rather than on the orderly nature of his files. Other factors such as the quality of information resources available would also have to be considered. Yet, the essential issue, really, is one of efficiency and development of the practice's knowledge base. A vet who is efficient and effective in the discovery, storage, retrieval and dissemination of information, is on an upward spiral of saving money and time which can be reinvested in the practice and its resources while all the time providing a higher quality service to the patient and client which can then justify higher fees. That is the theory at least but what is the reality? In an attempt to answer this question, there follows a short profile of each interviewee.

V1 like V2 preferred more traditional forms of information seeking to the online variety, finding it hard to sift through pages on screen (1:55-57). She firmly believed that she could source all the information she needed from books (1:141). One problem that she shared with V6 was the dispersal of information across the constituent practices (1:62-63). This was overcome by informal rules about the location of key resources and telephone contact (1:96-105) but she was aware that networked resources could also help here (1:138-139). A hoarding tendency meant that her files were becoming unmanageable – she failed the 'duplicate request'

test, for example (1:83-85). V1 specifically requested information skills training/guidance (1:258-266).

V2 exhibited very organised and disciplined ISB/IU and reinforces the fact that a certain amount of time needs to be allocated to information related activities if the individual is not to become overwhelmed by it all. This includes time allocated to weeding files (2:556-560). V2 had the advantage of living and working near a VIS and being a former member of academic staff at the university in question. The latter point explains her highly developed browsing (2:365-368), chaining (2:421-423) and monitoring (2:388-394) activities (after Ellis, 1993b). V2 was using technology to successfully to support her ISB whether it be the *Psion* Portable Data Assistant (PDA) to keep a track of references and reference requests (2:459-461) or her scanner to exchange documents for monitoring purposes (2:409-415). That said despite her obvious familiarity with online information, V2 impulsively went to books rather than electronic information, finding them easier to work with in terms of 'multi-tasking' than windows on a computer screen (2:546-555). Online sources will have to offer equivalent simplicity if they are ever to replace published information as preferred information sources.

V3 stated that 90% of the time inefficient ISB does not matter but 10% of the time it does – those occasions where knowledge gaps or information loss mean referrals are needed (3:711-724) and business lost. V3 readily acknowledged that his ISB was haphazard, in part due to poor information storage and retrieval methods and not knowing how to deal effectively with a deluge of information (3:688-696). He ended up relying on memory and his memory was 'terrible' (3:707-709). His preferred solution was being able to source all the information he needed through the Internet (3:649-650). This, of course, is very dependent on the right information being on there in the first place and easy to locate and download, otherwise he would experience the same kinds of problems in his online ISB as he does already. Certainly, CD-ROM or online (with back issues included) subscriptions to his preferred journals (if available) would solve some of his storage, indexing and retrieval problems. Finally, V3, like V2, owned a PDA but was using it primarily for veterinary informatics purposes. He did believe that being able to download some kind of library catalogue list would be helpful (3:916-922).

V4 was confident of being able to find anything he wanted from his own filing system, based on classification of items by anatomical area, in 5 minutes (4:1034-1035). However he describes an unsuccessful attempt to find a succinct article on mountain sickness on the Web using *MEDLINE* or other sites (4:1078-1090). Is this a reflection of his searching skills/awareness or of the Web itself? The answer is

probably somewhere in between as suggested by his problems with the Article Type field in *MEDLINE* (4:1092-1107) but this could only be tested under controlled conditions. Aside from the need for current awareness on Internet matters, some form of Internet training would surely be of some benefit, if only to check that various tips, short-cuts and portals were known to the individual.

V5's ISB was compromised by the time pressures of running a small practice (5:1421-1425). He talked of snatching 5 or 10 minutes to look up something on the Net where possible but was frustrated by his own computer skills, the lack of order on the Net (5:1470-1478) and the hype which surrounds it; leading to false expectations such as he experienced with online airline ticket purchasing (5:1490-1497). He had no formal classification system for his personal information, relying on his memory for retrieval. His ISB was thus pragmatic or in his words 'not good but good enough' (5:1415-1416), making the best of the time and resources at his disposal and referring cases if he lacked knowledge in certain areas (5:1412).

V6's ISB was not really explored. However, he was the only interviewee to use reference managing software (6:1801-1804). His ISB was compromised slightly by working in a multi-site practice (for the same reason as V1) in that it was difficult to share physical resources effectively (6:1894-1895). Although V6 had given up using the Net for work anyway because of connection times, only one site where he worked had Internet access and this could be only be used after office hours (6:1812-1815).

V7 acknowledged that Internet training would be of use to him (7:2054), having described a fruitless attempt to purchase a new car via the Web (7:2013-2019). Here his search techniques could be called into question as a wider use of synonyms and broader terms may have found the kind of site he was looking for via the established search engines. Yet his 'offline' ISB seems comparatively more careful and methodical – preparing an index and abstracts for his own collection of useful papers (7:2100-2105) with the occasional trip to RCVSWL to update his knowledge of secondary information sources (7:1905-1906).

A private affair?

One finding from the interview stage deserves further research - the strongly held view by an interviewee that any ISB should be done in private, that is to say, *not in front of the client.* This arose when discussing the potential use of PDAs when on call. V7 was adamant that consulting any source in front of a client was frowned upon as it was not seen to be 'professional' (7:2184-2192).

12 - Discussion

Referring back to the Literature Review, it seems that this research's findings merely confirm those published previously. Journals and textbooks continue to be the information sources of choice for practitioners in this survey's sample, just as they were some 20 years ago when Drake & Woods conducted their research. Despite advances in technology, books are still the emergency information source *par excellence* as (re)confirmed by Pelzer & Leysen in 1991. Even if more practices in this survey had computers (100%) than was the case for Valleley in 1993 (77%), the same conclusion applies now as did then – administrative tasks such as word-processing and accounting comprise the majority of computer activity, despite the arrival of the Net and email. What is more, the major barrier to IU identified by Raw – lack of time - is still as prominent as ever.

New ground has been covered, though, especially with regard to the Internet. More vets in this survey were using the Net for their work than were in Gerrard's survey last year (68% versus 28%) and there appeared to be less uncertainty about getting connected. One of the key findings for the purposes of this survey was the very low use of library catalogues which, on the basis of the interviews, can be attributed in part to lack of publicity but also to the fact that such catalogues usually contain only bibliographic data. Secondly, the findings effectively give the RCVSWL, as the 'profession's library' (Horder, 1994), a mandate to assume a leading role in filtering the useful from the irrelevant on behalf of the profession, a position that is as yet unfilled in the eyes of the respondents.

But perhaps the most telling statistic is the one that shows that more respondents reported using the Net for their work than reported using a veterinary library (by whatever means). This is by no means a death knell for VIS, more a wake-up call, as the main demand of user and non-user alike was the provision of easier access to VIS resources via the Internet and to full-text journal articles in particular. The analogy is apt as this demand for remote access to VIS and the RCVSWL was anticipated in a 1994 article by the librarian at the time, Benita Horder:

> Future possibilities for our users may well include dial-up access, not only to our catalogue, but also CD-ROM databases. One or two medical libraries are already providing out-of-hours access to medical databases in this way. Electronic publishing is likely to increase over the next decade. Further specialisation and the need for continuing professional development will lead to increasing use. Individual access to databases is likely to become more widespread, but there will still be a need for the librarian as an intermediary and to provide the backing services of photocopying and lending.

Horder was writing just before the Internet became a public network and so was advocating direct dial-up as opposed to dial-up via a proxy which is now commonplace. However, what she proposed is now a reality thanks to the potential of the Internet.

Recent developments

RCVSWL is already addressing the information needs of its academic research users via its 18 month joint collaboration with RVCL, the Accessing & Supporting Veterinary Information Needs (ASVIN) project, funded by the Research Support Libraries Programme. ASVIN's goals are based on enhanced collaboration amongst the major VIS in the UK in the following areas: catalogues (cross collection searching via the Z39.50 protocol); common/consortia collection development strategies (e.g. electronic journal access and archiving, grey literature) and document delivery/inter library loans.

Some if not all of this work will be of indirect benefit to the practitioner and ties in nicely with some of the findings of this survey, e.g. the value of promotional literature (a form of grey literature) as a drug information source. But the question must be asked – will the benefits trickle down? Public funding in the academic arena is not meant to subsidise the business community, nor are any discounts from suppliers accorded to academic institutions in recognition of their unique role and status. This explains why LBSL's *ProQuest Direct* service described below is not available to all library users and its terms of use are limited to private (as opposed to corporate) research. Conflicting interests such as these are now common place in institutions such as RCVSWL with a wide cross-section of user groups.

An example of an RCVS information related initiative that could benefit practitioners is *Vet Web*. This was one of nine projects to be awarded a grant in 1995 by the RCVS CPD Sub-committee to promote CPD as a vital professional activity. It is a free information service provided to members of the veterinary profession, veterinary nurses, students and practice managers, intending to 'promote CPD by offering busy veterinary practitioners an resource to access information regarding matters related to CPD and General Practice…and promote the cause of any others within the veterinary community involved in CPD.' Unfortunately, four years later, the site is still under developed and under construction and is perhaps more of use to the client looking for a vet with an online presence than for a vet looking for veterinary information (other than other vet contact details). The product directory and new product sections are empty and the list of links poor. The latter criticism, incidentally, can also be made of the RCVSWL pages of the RCVS web site [http://www.rcvs.org.uk].

The one development which goes some way to meeting the needs of the practitioners surveyed in this project is *VetGate*, a so-called 'hublet' of the larger *BIOME* information portal [http:/biome.ac.uk], covering all subjects related to animal health. Its stated audience is

veterinary surgeons, nurses and other veterinary professionals; animal health researchers, lecturers and students; producers and suppliers of veterinary goods, services and information. RCVSWL will be a major participator this project. It will catalogue all types of veterinary Internet resource against an agreed set of evaluation guidelines for inclusion into the *VetGate* database (Gray, 1999). The project design will be based on the *OMNI* portal for human medicine [http://omni.ac.uk] which *BIOME* subsumes. *OMNI* is basically a search engine for a very closely monitored collection of Web resources that have been assigned MeSH indexing terms by human editors. *VetGate* once up and running will begin to address the problem of there being no 'one-stop' site for veterinary information at present but may take a year to prove its value to practitioners as its underlying content increases.

Full-text journals

VetGate is unlikely to meet the expressed demands for full-text journal articles. One possibility is for RCVSWL to make greater use of the Web functionality of their *Unicorn* library management system by inserting the respective URL of an electronic journal in the Marc 856 field of each record. The user would then be able to 'click through' the catalogue to the web site. Leaving aside the question of cost which will be considered later in this section, such a set-up may not be suitable for all electronic journal sites due to the different password systems (and passwords) involved. As many university librarians will testify, the proliferation of passwords, partly due to publishers' concern over losing control of their material and partly due to the lack of a legally admissible single electronic ID number (or passport or 'signature') is both an administrative nightmare and a new form of barrier to IU.

However, university libraries can still provide a viable working model for full-text journal delivery to remote users. A good example is the London Business School Library's (LBSL) use of the *Bell & Howell's ProQuest Direct* service. This is an example of a web-based host system whereby the library subscribes to a particular database such as *ABI/Inform* (business) or *INSPEC* (engineering), the content of which is then accessible to library users via *Bell & Howell's* web interface (after Eaton, 1999). LSBL have overcome the problem of access rights by establishing a gateway to the service inside their password controlled extranet. This eliminates the need for IP address registration. Since staff, students and alumni are the only users to have passwords, they can all access *ProQuest* from home simply by logging on to the extranet via their web browser once connected to the Internet.

The *ProQuest* interface is both easy to use and functional. Searches can be conducted according to publication name or key words with field specific limitations, including citation searching. Effective searching is possible thanks to the numerous subject terms allocated to each article, e.g. entering 'ratings & rankings' in the subject field will limit searches to articles that contain ranked lists for the given subject area. Hits are displayed in title order with links to

abstract, HTML text and full-page images (*Adobe Acrobat* PDF format) where available and can then be marked for printing or emailing.

RCVS already has a Web presence and so it would be possible to set up a password restricted area. The main problem is that RCSVWL would have to explore with *Bell & Howell* whether veterinary related databases such as *BEASTCD, VETCD, AGRICOLA* or *CAB ABSTRACTS* could be licensed from their publishers and mounted on the system and, if so, with what underlying full-text information as these are bibliographic databases. Alternatively, the *Gale Group* offers a similar host service but enables libraries to specify the journals to be mounted on the system (Eaton). RCVSWL could then refer to the research cited in the Literature review and to various animal science bibliometric studies performed (e.g. Hoffmann & Klawiter-Pommer, 1977; Manten, 1977) to formulate a list.

Alternatively, bibliographic database providers/publishers such as *Silverplatter* and *Ovid* are already linking up their databases to full-text journal content supplied by journal publishers in the medical fields. The same cannot be said for the more specialised veterinary journals which are abstracted only. Hence a purchasing consortia of VIS and related bodies (Animal Health Information Specialists, European Veterinary Libraries Group and the Veterinary Medical Libraries section of the Medical Library Association) could be called upon to lobby such suppliers to consider servicing the veterinary information market.

Cost recovery

It seems, on the basis of this research, that a transactional, 'pay as you go' service is the most appropriate payment model for the profession and, certainly, host systems such as *ProQuest Direct* are able to offer this subscription payment model (Eaton). However, this is but one aspect of the total costs involved. Certainly, RCVSWL would be able to make use of their usage statistics in any negotiations with service providers or publishers, indicating an average number of requests per vet which, with a total potential client base of 9500 general practitioners (RCVS Manpower Survey), could amount to at least £50,000/year assuming a £1/article charge. This does not include the other categories of RCVS member of course. This is attractive in the medium to long term but in the short term, the publisher/provider is likely to be concerned about the costs of starting up such a service, particularly if a journal title required is unavailable in electronic format (e.g. *Veterinary Record* or *In Practice*) and requires an expensive retro-conversion using OCR scanning technologies. Hence the need for an annual subscription charge, very much along the lines of that proposed by V3 in the interviews. A £125 charge would raise over £1 million annually to ensure the continued expansion of the document base for such a system.

It would be up to RCVS to decide whether this fee could be met in part from existing members' fees or as optional extra. On the one hand, the latter would be fairer in that non-users would not

be subsidising users but on the other hand, the former emphasises that the system is for the benefit of the profession as a whole. What is clear is that RCVSWL would not be able to fund such a system itself from its standard journal subscription budget (£17,000 for 1998 according to its Collection Development Policy). It is unknown whether a one-off, block grant could be obtained from the appropriate RCVS internal committee to help fund the start-up of such a journal service. But that should not prevent RCVSWL from striving to obtain the best possible deal and access for practitioners by representing the profession in any negotiations.

V5 inadvertently raised the fundamental question about intermediaries (and hence) libraries in general. In the course of the discussion in which he adopted a 'wait and see' approach to the idea of an intermediary service, focusing on cost, success and speed factors (5:1306-1307, 1536), he came to the conclusion that intermediaries were ultimately unnecessary if all they were doing were typing keywords or conditions into a well-designed computer database as that could be done directly by the original requester who would also be able to filter the information returned. This, of course, is the potential scenario offered by the Internet. However, the interviewees' experiences with the Internet confirm that this scenario is a long way from being realised.

The future

The mixed and muted response to delegation in veterinary ISB identified in the surveys and interviews sits uneasily with the future of the profession spelt out by the RCVS president, Dr Lydia Brown, at the BSAVA congress earlier this year (Anon., 1999). Dr Brown believed that the profession would reflect trends taking place in society at large and this would mean that the profession would have to work smarter rather than harder and consider other ways to get the job done. It is suggested that better and more efficient use of technology (especially Internet technology) is only part of the answer.

For there is the imminent arrival of the 'para-vet' to consider and a proposed redefinition of work that could be performed by non-vets. Both would naturally lead to new ways of working, Dr Brown claimed, and both will obviously involve delegation of information seeking as well. Finally, there is the ongoing debate over the status of veterinary nurses. Dr Brown hinted that they may ultimately be officially absorbed within the RCVS. This too would entail a reconsideration of roles. There is no reason why veterinary nurses could not undertake more information seeking, especially if it has been reinforced with an information module in their training or a formal diploma (achieved via distance learning). Clearly, there could be a new market here for LIS departments to target new learning products in partnership with the professional associations. However the impetus must come from the associations themselves, having established a dialogue with their members on the subject.

13 – Conclusions

In this section, the questions set out in the Aims & Objectives section are reconsidered in the light of the project findings. This will serve as a summary of key findings and identify areas where further research is needed. Once again, it is stressed that any conclusions apply to the sample population and may not apply to the general practitioner population as whole.

- *What information sources are being used?*

  In general, journal articles, textbooks and conferences. Additional sources come into play for drug information: promotional literature and company representatives are well used. In terms of Internet sources, professional institution web sites and veterinary information web sites are used the most. *Vetstream* CD-ROMs are used the most for this kind of source. Finally, other vets in the UK can be considered the principal email information source and RCVSWL the principal VIS.

- *Are some information sources used more than others?*

  Yes. Non-use analysis yielded useful examples. Generally, annual reviews, abstracts/ indexing services and laboratories were the kinds of source least used. But also it was found that electronic information sources were used much less than printed or oral sources. Breaking electronic information down, it was found that mailing lists and library catalogues were the least used Internet resource while laboratory staff and librarians were not popular email correspondents. Looking from another angle, more respondents reported using the Internet than using a veterinary library. CD-ROM use could best be described as 'occasional'.

- *What are the variables that determine this?*

  This will depend on the individual and the resources at hand. In some ways, this is a circular question as the underlying information need is the main variable. So if the information that is needed has to be easy to use, quick to access, succinct, accurate, authoritative and reliable, i.e. information that can be used in an emergency, then practitioners learn through experience that only a few sources can meet those criteria – specific books and colleagues on the basis of this project's findings. CD-ROM usage is sporadic because titles are mainly being used for current awareness needs which is a non-urgent task usually fitted in around work patterns. If answering patient-care questions was the primary usage then it is likely that daily searches would be performed as part of the work routine as patient-care is a core veterinary activity.

  However, the question also encompasses variables such as practice type, size and age of practitioners. Here, the sample size made such generalisations risky and a larger, statistically significant survey would be needed. Nonetheless, the above variables were not

found to affect computer use. Some variations were found when looking at IU in more detail. For example, in terms of diagnostic information needs, practice colleagues were relied on more by mixed animal practitioners than small animal practitioners while small animal practices used practice records as a resource for drug information to a much greater than mixed animal practitioners. It was beyond the scope of the project to examine the minutiae in detail but the basis is laid for further research.

- *How long does it take for satisfactory information to be found?*
  Further research is required here for a detailed answer. However, it is apparent that it takes longer than is required for practitioners to find satisfactory information on the Internet and that this is in part due to lack of information skills and in part due to lack of filtered veterinary information. Also, the fact that time was considered to be the main IU barrier is arguably an indication that respondents were struggling at times to find satisfactory information in the time available.

- *Are intermediaries used in the search process?*
  Not really. The majority of CD-ROM searches were performed alone. The very lukewarm response to the various intermediary ideas presented to overcome time barriers to IU indicated a strong resistance to delegated searching. The high 'don't know' response combined with the interview analysis suggests that this is due to general unfamiliarity with mediated searching (as it is not generally available) and consequent hesitation to delegate.

- *What use is made of information technology in the search for, and delivery of, information?*
  This project has found that despite a relatively high connectivity rate to the Internet, ISB comprises under a third of all computer activity. Word processing and accounting activities remain the core IT functions. A minority of respondents had laptops and PDAs but, despite the kinds of small scale experimentation revealed in the interviews, it can be surmised that such devices are being used for the same core computer activities as the PCs in the practice. Veterinary email use, on the other hand, merits a whole dissertation by itself. This is the dynamic area with more and more vets gaining addresses and, according to the interviews, is the area where most experimentation in information exchange takes place, especially non-textual information. The advent of the legally-admissible digital signature, new digital imaging standards and cheaper digital equipment (still and video cameras, for example) can only compound this activity.

- *From what sources do vets obtain non-clinical information?*
  On the basis of the interview analysis, it would seem that vets go to the relevant professional body or preferably to the nearest person in the particular profession. Undoubtedly, the RCVS (not the library) will be contacted for legal matters. However, further research is required here.

- *What can libraries/information services do or offer to help practicing vets?*
  Firstly, offer remote, 24 hour access to library services via the Internet. Secondly, enable access to the full-text of veterinary journals. Thirdly, help practitioners to help themselves by offering a variety of training courses and materials using a variety of methods and media. Fourthly, filter Internet information for practitioners by whatever means. Fifthly, represent the interests of the profession in appropriate fora and committees relating to veterinary information (in all its forms, but particularly non-textual). Finally, take advantage of Internet technologies to try out new services and new delivery options.

14 - Recommendations

One of the explicit aims of this project was to consider the implications of veterinary IN/ISB/IU for current and future information service provision. Accordingly, the following recommendations for action by RCVSWL have been formulated on the basis of the project findings

1. An appeal should be made to vets to disclose their email addresses and web addresses (where applicable) to RCVS to be entered into the various RCVS databases. The benefits to members of doing so should be stressed, e.g. in order for the dialogue between RCVS and members and the speed and quality of information provision to be enhanced. Such an appeal should feature prominently on the RCVS web site, newsletter and any other relevant literature sent out to members. This is an important first step for improving dialogue between the library and its potential users and would be a valuable tool for promotional purposes (see below).

2. RCVSWL needs to actively promote its services and potential benefits to members as well as show that it is relevant in the new online world. This can be achieved on many fronts using printed and online media. Some suggested ideas are as follows:

    a) Establish a library newsletter as distinct from a column in the RCVS newsletter. This could be then mailed out with the RCVS newsletter to save on postage costs. An email or online version could also be established. Sections could include tips on online searching, new web sites, new textbooks and current journals. There is also advertising potential here, depending on RCVS policy.

    b) Publish more training guides, including interactive information skills tutorials on the web. Prepare help sheets or guidance notes on filing etc. The library could produce and sell such guides as an extra revenue source or even consider commissioning a book on the subject as the only real example (Blood & Brightling) is fast becoming out-of-date. There is a definite market opportunity for the library to offer training courses relating to selected disciplines and skill sets.

    c) Raise the library profile by encouraging staff to publish articles, or sponsor articles on information in prominent veterinary journals.

    d) Flag up work such as *VetGate* being carried out by RCVSWL on behalf of practitioners using the methods above. Emphasise that this is addressing the problem of lack of quality veterinary information on the Internet.

e) Look for promotional tie-ins, e.g. X% off textbooks bought on library recommendation through Amazon, X% off CD-ROMs bought through the library. Consider producing promotional items (mugs, mouse-mats etc) with RCVS sponsored web site and email addresses.

f) Identify 'best practices' and use them to promote 'best practice' – showing how information and electronic resources in particular can be used effectively. Feature articles could be inserted in appropriate publications, e.g. In Practice Visits could also be arranged as part of CPD or training courses.

g) Low awareness of the RCVSWL web catalogue should be addressed by using the promotional methods identified above. In addition, link and icon exchanges with other Internet site owners and submission of the site to search engines could also be effective. It may be that the library's role as a back-up resource precludes greater use by practitioners but awareness is an essential first step towards use. For this reason, web log analysis of the RCVSWL pages is recommended to build up a profile of the catalogue use.

3. A detailed survey of the computer hardware and software owned (and intended to be owned) by vets is needed to measure accurately the numbers able to access online information and hence plan information service demand and supply in the future. Such data is also vital when conducting negotiations with online information suppliers. The various surveys conducted by the AVMA Center for Information Management in the USA (Wise & Yang, 1992a, 1992b) provide a useful precedent for this task.

4. Electronic journal provision to *practitioners* needs to be addressed. It is suggested that, whether acting alone or as part of a consortia, RCVSWL starts to explore viable options (including those identified in the Discussion) with host providers and publishers and, crucially, informs RCVS members of progress made and options available. This is clearly an area where members expect the library to take the initiative as opposed to letting each individual practice negotiate with publishers. As a very short term measure, it is suggested that existing RCVSWL subscriptions are examined for online equivalents and free trial periods established with the permission of the publishers to enable practical issues to be identified. It will also be very good publicity for the library who will be seen to acting quickly and positively to address user needs.

5. RCVS, whether through the library or another internal body, should make sure that it represents the interests of the profession in the area of veterinary informatics, particularly digital imaging and high definition technologies, digital archiving standards, legal admissibility of digital material.

On a final note, it is hoped that some action will result from this project as future research in this area will be prejudiced if a professional population is '…researched to death but sees no resultant services' (after: University of Texas System Valley/Border Health Symposium, 1990).

It was felt appropriate that selected sections of this dissertation should be published in the RCVSWL section of the RCVS web site [http://www.rcvs.org.uk].

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NB. The interview stage of this project was facilitated by the GIS software at http://www.multimap.com which provided street-level maps from any UK post-code.

16 - Tables & Figures

Table 1

Geographical distribution of UK practices

County	# Practices	# Surveys	# Returns	# Interviews
Avon	67	7	2	
Bedfordshire	18	2	1	
Berkshire	54	3	1	1
Birmingham	26	2	1	
Buckinghamshire	31	4	1	
Cambridgeshire	52	5	2	
Chesire	84	4	2	
Cleveland	19	0	0	
Cornwall	53	2	1	
Cumbria	45	4	1	
Derbyshire	45	5	2	
Devon	111	12	7	1
Dorset	53	2	2	1
Durham	19	3	0	
Essex	99	9	2	
Gloucestershire	53	3	0	1
Hampshire	93	6	3	
Hereford & Worcester	53	3	2	
Hertfordshire	70	5	3	
Humberside	37	4	1	
Kent	113	6	0	
Lancashire	99	5	1	
Leicestershire	35	1	0	
Lincolnshire	40	3	1	
London	162	11	7	
Manchester	25	1	0	
Merseyside	44	3	1	
Norfolk	53	1	0	
North Yorkshire	59	3	1	
Northamptonshire	22	1	1	
Northumberland	25	1	1	1
Nottinghamshire	46	2	1	
Oxfordshire	50	2	1	
Shropshire	53	5	3	
Somerset	55	3	1	
South Yorkshire	47	2	0	
Staffordshire	51	2	1	
Suffolk	53	2	1	
Surrey	110	9	3	
Sussex	120	5	1	
Tyne & Wear	26	2	1	
Warwickshire	36	7	3	
West Midlands	67	7	3	
West Yorkshire	76	7	1	
Wiltshire	62	2	1	
Total (England)	**2611**	**178**	**68**	**5**
	80%	**84%**	**80%**	
	(of UK total)	(of total sent)	(of returns)	
Co Antrim	32	2	0	
Co Armagh	4	0	0	
Co Down	19	0	0	
Co Fermanagh	7	0	0	
Co Londonderry	10	1	0	
Co Tyrone	16	0	0	
Total (N. Ireland)	**88**	**3**	**0**	
	3%	**1%**	**N/A**	
	(of UK total)	(of total sent)		

Table 1

Geographical distribution of UK practices (continued)

County	# Practices	# Surveys	# Returns	# Interviews
Clwyd	35	2	0	
Dyfed	36	0	0	
Gwent	24	3	1	
Gwynedd	20	2	1	
Mid Glamorgan	19	2	1	
South Glamorgan	19	0	0	
West Glamorgan	19	0	0	
Powys	24	1	1	
Total (Wales)	**196**	**10**	**4**	**0**
	6%	**5%**	**5%**	
	(of UK total)	(of total sent)	(of returns)	
Borders	11	2	1	
Central	18	0	0	
Dumfries & Galloway	22	2	2	
Edinburgh	26	0	0	
Fife	19	4	1	
Glasgow	25	0	0	
Grampian	41	1	1	
Highland	24	0	0	
Lothian	24	2	2	
Orkney Islands	4	0	0	
Shetland	2	0	0	
Strathclyde	74	4	3	1
Tayside	31	2	2	1
Total (Scotland)	**321**	**17**	**12**	**2**
	10%	**8%**	**14%**	
	(of UK total)	(of total sent)	(of returns)	
Guernsey	4	1	0	
Jersey	6	1	1	
Alderney	1	0	0	
Total (C. Isles)	**11**	**2**	**1**	
	0.3%	**1%**	**1%**	
	(of UK total)	(of total sent)	(of returns)	
Isle of Man	7	0	0	
Isle of Wight	15	0	0	
Other	**22**	**0**	**0**	
	1%	**N/A**	**N/A**	
	(of UK total)			
Total (UK)	**3249**	**211***	**85(81)**	**7**

* Includes 1 unknown location Percentages have been rounded up/down

Source: RCVS Practice Database

Table 2

Number of veterinary practices by type

Practice type	Number (*n*)	Survey %	UK %*	Interviewed
Mixed	28	34	54	1
Large	5	6	1	1
Equine (100%)	3	4	3	1
Small	45	55	37	4
Poultry (100%)	1	1	0.3	0
Other	0	0	5	0
Total	**82**	**100**	**100**	**7**

** Source: RCVS Practice Database*

Table 3

Size of veterinary practices

Practice size	Number (*n*)	Survey %	UK %*
One man	14	17	28
2-3	25	30	34
4-5	15	18	21
6-10	24	29	15
11+	4	5	2
Total	**82**	**100**	**100**

** Source: RCVS 1998 Manpower Survey*

Table 4

Survey practice size by survey practice type

Size / Type	Mixed	Large	Equine	Small	Other
One man	2	2	2	8	0
2-3	6	1	0	17	1
	8	**3**	**2**	**25**	**1**
4-5	6	2	0	7	0
6-10	11	0	1	12	0
	17	**2**	**1**	**19**	**0**
11+	**3**	**0**	**0**	**1**	**0**
Total	**28**	**5**	**3**	**45**	**1**

Table 5

Age of vets in general practice

Age range	Number (*n*)	Survey %	UK vets %*
30 or younger	7	9	27
31-40	26	32	34
41-50	36	44	22
51-59	10	12	11
60 or older	2	2	6
Total	**81**	**100**	**100**

** Source: RCVS 1998 Manpower Survey*

Table 6

Non-use of Internet resources

Internet resource	Number (n)	% of Internet users
Mailing lists	46	85
Library catalogues	42	78
Newsgroups	40	74
Newspapers	40	74
Publishers' web sites	40	74
Other media	39	72
Online databases	37	69
Research institution web sites	33	61
Pharmaceutical company web sites	31	57
Electronic journals	30	56
Governmental web sites	28	52

Table 7

Non-email exchange

Correspondent type	Number (n)	% of email for work users
Government officials	51	91
Laboratory staff	48	86
Librarians	46	82
Clients	38	68
Colleagues in the practice	38	68

Table 8

Ranked drug information sources

Information source	Number (n)	% of respondents
Journal articles	72	88
Textbooks	71	87
Conferences	63	77
Promotional literature	63	77
Company representatives	60	73
Practice colleagues	56	68
Training courses/workshops	48	59
Conference proceedings	47	57
Encyclopedia/compendia	45	55
Other vets	45	55
Personal notes/files	43	52
Current awareness publications	31	38
Practice records	30	37
Other books	25	30
Databases	21	26
Internet sites	20	24
References/citations	18	22
Abstracting/indexing services	17	21
Laboratory	15	18
Annual reviews	10	12
Other	7	9

Table 9

Ranked diagnostic information sources

Information source	Number (n)	% of respondents
Journal articles	78	95
Textbooks	71	87
Conferences	71	87
Other vets	65	79
Practice colleagues	64	78
Training courses/workshops	61	74
Conference proceedings	51	62
Personal notes/files	43	52
Laboratory	42	51
Current awareness publications	35	43
Encyclopedia/compendia	31	38
Promotional literature	29	35
Practice records	25	30
Other books	23	28
Databases	22	27
Internet sites	21	26
References/citations	22	27
Company representatives	18	22
Abstracting/indexing services	17	21
Annual reviews	10	12
Other	5	6

Table 10

Ranked therapeutic information sources

Information source	Number (n)	% of respondents
Journal articles	73	89
Textbooks	73	89
Conferences	69	84
Practice colleagues	63	77
Other vets	61	74
Training courses/workshops	57	70
Conference proceedings	50	61
Promotional literature	47	57
Personal notes/files	42	51
Company representatives	40	49
Encyclopedia/compendia	38	46
Current awareness publications	33	40
Practice records	29	35
Other books	29	35
Databases	21	26
Internet sites	21	26
References/citations	18	22
Laboratory	17	21
Abstracting/indexing services	15	18
Annual reviews	11	13
Other	5	6

Table 11

Drug information source use by mixed and small practices

Information source	Mixed	%*	Small	%*
Journal articles	24	**86**	41	**91**
Textbooks	23	**82**	40	**89**
Conferences	18	**64**	39	**87**
Promotional literature	23	**82**	34	**76**
Practice records	9	**32**	34	**76**
Company representatives	23	**82**	33	**73**
Practice colleagues	20	**71**	33	**73**
Other vets	11	**39**	29	**64**
Training courses/workshops	18	**64**	27	**60**
Conference proceedings	14	**50**	26	**58**
Personal notes/files	12	**43**	26	**58**
Encyclopedia/compendia	18	**64**	23	**51**
Current awareness publications	8	**29**	20	**44**
Other books	8	**29**	15	**33**
Databases	4	**14**	14	**31**
Internet sites	5	**18**	12	**27**
References/citations	3	**11**	12	**27**
Abstracting/indexing services	1	**4**	11	**24**
Laboratory	4	**14**	9	**20**
Annual reviews	2	**7**	5	**11**
Other	2	**7**	4	**9**

** Note: % of respective practice respondents*

Table 12

Diagnostic information source use by mixed and small practices

Information source	Mixed	%*	Small	%*
Journal articles	27	**96**	43	**96**
Textbooks	27	**96**	39	**87**
Conferences	23	**82**	40	**89**
Promotional literature	6	**21**	20	**44**
Practice records	8	**29**	14	**31**
Company representatives	3	**11**	13	**29**
Practice colleagues	24	**86**	35	**78**
Other vets	23	**82**	36	**80**
Training courses/workshops	23	**82**	32	**71**
Conference proceedings	17	**61**	27	**60**
Personal notes/files	15	**54**	23	**51**
Encyclopedia/compendia	11	**39**	17	**38**
Current awareness publications	10	**36**	21	**47**
Other books	9	**32**	12	**27**
Databases	3	**11**	15	**33**
Internet sites	7	**25**	11	**24**
References/citations	4	**14**	14	**31**
Abstracting/indexing services	1	**4**	11	**24**
Laboratory	18	**64**	23	**51**
Annual reviews	2	**7**	5	**11**
Other	2	**7**	3	**7**

** Note: % of respective practice respondents*

Table 13

Therapeutic information source use by mixed and small practices

Information source	Mixed	%*	Small	%*
Journal articles	25	**89**	42	**93**
Textbooks	26	**93**	40	**89**
Conferences	23	**82**	39	**87**
Promotional literature	12	**43**	30	**67**
Practice records	13	**46**	14	**31**
Company representatives	13	**46**	24	**53**
Practice colleagues	23	**82**	35	**78**
Other vets	21	**75**	33	**73**
Training courses/workshops	22	**79**	30	**67**
Conference proceedings	16	**57**	28	**62**
Personal notes/files	13	**46**	25	**56**
Encyclopedia/compendia	14	**50**	21	**47**
Current awareness publications	8	**29**	21	**47**
Other books	12	**43**	15	**33**
Databases	4	**14**	14	**31**
Internet sites	6	**21**	12	**27**
References/citations	3	**11**	12	**27**
Abstracting/indexing services	1	**4**	10	**22**
Laboratory	4	**14**	12	**27**
Annual reviews	2	**7**	6	**13**
Other	2	**7**	3	**7**

Table 14

Drug information source use by practice size

Information source	1	1-3	4-10	11+
		Number (*n*)		
Journal articles	12	**33**	36	**3**
Textbooks	12	**33**	36	**2**
Conferences	11	**28**	31	**4**
Promotional literature	10	**28**	31	**4**
Practice records	4	**13**	16	**1**
Company representatives	10	**24**	33	**3**
Practice colleagues	5	**22**	30	**4**
Other vets	10	**23**	22	**0**
Training courses/workshops	8	**21**	25	**2**
Conference proceedings	10	**24**	33	**3**
Personal notes/files	10	**22**	21	**0**
Encyclopedia/compendia	8	**24**	20	**1**
Current awareness publications	5	**16**	15	**0**
Other books	3	**11**	13	**1**
Databases	3	**14**	7	**0**
Internet sites	5	**12**	7	**0**
References/citations	4	**10**	8	**0**
Abstracting/indexing services	5	**10**	7	**0**
Laboratory	2	**7**	8	**0**
Annual reviews	3	**5**	5	**0**
Other	1	**4**	3	**0**

Table 15

Diagnostic information source use by practice size

Information source	1	1-3	4-10	11+
		Number (*n*)		
Journal articles	14	**37**	38	**3**
Textbooks	12	**32**	36	**3**
Conferences	12	**31**	36	**4**
Promotional literature	5	**13**	14	**2**
Practice records	3	**11**	14	**0**
Company representatives	2	**6**	12	**0**
Practice colleagues	5	**24**	37	**3**
Other vets	12	**32**	32	**1**
Training courses/workshops	8	**24**	34	**3**
Conference proceedings	12	**31**	36	**4**
Personal notes/files	7	**21**	20	**2**
Encyclopedia/compendia	6	**16**	15	**0**
Current awareness publications	5	**18**	16	**1**
Other books	2	**9**	13	**1**
Databases	3	**15**	7	**0**
Internet sites	3	**10**	9	**2**
References/citations	5	**12**	9	**1**
Abstracting/indexing services	6	**13**	4	**0**
Laboratory	6	**19**	22	**1**
Annual reviews	3	**5**	5	**0**
Other	1	**2**	3	**0**

Table 16

Therapeutic information source use by practice size

Information source	1	1-3	4-10	11+
		Number (*n*)		
Journal articles	12	**34**	36	**3**
Textbooks	12	**32**	37	**4**
Conferences	11	**31**	34	**4**
Promotional literature	9	**25**	21	**1**
Practice records	4	**12**	16	**1**
Company representatives	9	**19**	18	**3**
Practice colleagues	5	**23**	37	**3**
Other vets	11	**28**	31	**2**
Training courses/workshops	9	**24**	30	**3**
Conference proceedings	11	**31**	26	**4**
Personal notes/files	8	**21**	21	**0**
Encyclopedia/compendia	7	**20**	18	**0**
Current awareness publications	5	**17**	16	**0**
Other books	2	**12**	14	**3**
Databases	4	**15**	6	**0**
Internet sites	4	**12**	8	**1**
References/citations	4	**10**	8	**0**
Abstracting/indexing services	5	**11**	4	**0**
Laboratory	3	**9**	8	**0**
Annual reviews	3	**5**	6	**0**
Other	1	**2**	3	**0**

Table 17

Computer activities by practice type

	Mixed	Large	100% Equine	Small	Total*
Computer activity		**Number of responses (n)**			
Word processing	25	5	3	40	**73**
Accounts/invoicing	25	5	3	37	**70**
Label printing	23	3	2	33	**61**
Vaccination reminders	21	2	1	35	**59**
Maintain patient client/records	20	3	3	30	**56**
Email communication	15	4	2	34	**56**
Internet searches	15	4	3	31	**54**
Drug ordering	14	3	1	26	**44**
Desktop publishing	13	3	1	21	**37**
Diary/schedule	11	1	1	19	**32**
Stock control	9	2	1	20	**32**
Multimedia use	11	2	1	17	**31**
Veterinary notes	9	3	2	16	**30**
Database searches	6	3	2	18	**29**
Web site design/maintenance	5	0	1	8	**14**
Other	2	0	1	4	**7**
Total	**224**	**43**	**28**	**389**	**685**

Note - Respondents could select more than one activity
** - includes responses from 1 Other type practice*

Table 18

How do you keep up-to-date?

Classification				**Total**
Published	Journals		58	
	of which:	*Veterinary Record*	*10*	
		JSAP	*7*	
		In Practice	*5*	
		Other named examples	*15*	*37*
	Books		12	
	Other literature		13	
	Reading (unspecified)		11	36 **94**
Oral (1 - ∞ - 1)	Meetings			35
	Courses			20
	Conferences			9
	Seminars/lectures			6
	Congresses			4 **74**
Oral (1 - 1)	Colleagues			11
	Other vets			7
	Other contacts			4 **22**
Electronic	CD-ROMs			7
	Internet related			6
	Audio cassettes			2 **15**
Miscellaneous	Other activities			4
	CPD (unspecified)			7 **11**
	Total responses			**216**

Note – Respondents could provide more than one answer

Table 19

Preferred emergency information sources

Emergency source	Number (n)	% of responses
Books	50	45
Colleagues	20	18
Personal knowledge/experience	10	9
CD-ROMs/databases	8	7
Referral practice/hospital	7	6
Other	7	6
Personal notes	5	5
Internet	2	2
Laboratory	2	2
Total responses	**111**	**100**

Note – Respondents could select more than one source

Table 20

Rank list of ISB problems

Problem	Example(s)	Number (n)
Currency related	out of date	19
Availability	colleague busy	16
Content related	biased, irrelevant	16
Physical	bulky, hard to file	9
Design related	poor indexing	9
Time consuming	N/A	8
Speed of access/delivery	Internet downloads	8
Finding the known reference	N/A	4
Lack of resource awareness	where to look?	3
Too many sources	N/A	3
Other	cost	3
Total responses		**98**

Note – Respondents could select more than one source

Table 21

Work related information exchanged via email

Information type	Number (n)
Clinical/case related	27
Practice management related	23
(technical/computer related)	*(5)*
(product information)	*(3)*
(client)	*(2)*
Invisible college	10
Current awareness	8
Research related	7
Professional	6
Other	6
Total responses	**87**

Note – Respondents could provide more than one answer

Electronic journals	Newspaper	Other media	Professional institution	Veterinary information	Publisher	Drug company	Online databases	Newsgroups	Mailing lists	Research institution	Government	Library catalogues
AAEP	Daily Telegraph	BBC	AASP	Dierenarts.be	Amazon	antecint.com	Biomed	alt.med.vet	Compuserve forums	AMC NY	BSE enquiry	BMA
BMJ	De Standaard	Railtrack	BVA	Netvet	HMSO	Arnolds	Grateful Med	alt.med.veterinary	Equine Clinicians Network	Glasgow University	Foreign Office	Bodleian
EVJ	Guardian		BSVA	Pedigree Petfoods	Thieme. com	Bayer	Medline	Dermatology	Veterinary computer users group	Royal (Dick) Edinburgh	HSE	RCVS
FEMS	Herald		RCVS	Pet Plan		elanco.com	PubMed	VCU	Veterinary epidemiology	SAC	Inland Revenue	
HMS Beagle	Irish Times		SPVS	Vbet on the net		Hills Pet Nutrition	Vetderm		Vetplus-L	Upenn Raptor site	MAFF	
In Practice	Racing Post		VPMA	Vetlink		Intervet					Rabies site	
Journal of Animal Science	Scotsman		WAHVM	VetNet		Novartis					VMD	
Lancet	Times			Vetserve		Pfizer						
Nature				VetWeb		St Johns Dental						
New Scientist				VIN		Vet Drug						
Online Journal of Veterinary Research												
Veterinary Record												

Table 22 *Specific internet resources used by category*

Appendix B - Survey invitation letter

Appendix C – Previous research used in question design

Question (s)	Source(s)	Comments
1	Bawden, D. & Valleley, C. (1993)	Practice type is one of the main variables for distinguishing IN amongst vets. 'Large animal' could be subdivided further into 100% equine, 100% bovine etc (see RCVS Survey, 1998).
2	Raw (1987)	Reduced ambiguity.
4	Valleley, C. (1993)	Expanded form of original question to encompass new technologies. Narrowed focus to 'work-related activities'.
7	Pelzer & Leysen (1998)	Substituted 'Internet' for 'electronic'.
13	Pelzer & Leysen (1991)	Broadened original question.
14a	Drake & Woods (1978) Gravois et al. (1995) Nweke (1995) Pelzer & Leysen	Incorporates some elements from each source.
15	Pelzer & Leysen	Changed from closed to open question.
20-23	Dorsch (1997)	Amended to apply to CD-ROMs instead of MEDLARS. Ranking request introduced.
24	Gravois et al. Lundeen et al. (1994)	Expanded and ranking request introduced. Extra responses added.
25	Lundeen et al.	As above.
33-34	RCVS Survey (1998)	Age and nationality are key variables. No changes made here to categories so that results of both surveys can be easily compared.

Appendix D – Paper survey

The Royal College of Veterinary Surgeons
Wellcome Library Information Survey 1999

Thank you for agreeing to participate in this survey. It should take no more than 15 minutes to complete. Utmost confidentiality is assured. Data obtained will be aggregated and averaged. No individual will be identified.

Please return the questionnaire in the stamped addressed envelope provided.

Champagne Prize Draw

One questionnaire will be picked at random from all those completed and returned to determine the winner of a bottle of champagne.

Section A - About your practice

1 Please indicate the type of practice you work in:

- Mixed practice ☐
- Large animal practice ☐
- 100% equine practice ☐
- Small animal practice ☐

2 How many vets work at your practice (including yourself)? ☐

Section B - About you and computers

3a Do you use a computer for your veterinary work?

- Yes ☐
- No ☐

If you answered 'No', please move on to Section C

3b What type of computer(s) do you use?
Tick all that apply

- Desktop PC ☐
- Laptop PC ☐
- Macintosh (any type) ☐
- Palmtop ☐
- Other: ☐

4 What work-related activities do you use a computer for?
Tick all that apply

- Accounts/invoicing ☐
- Word processing ☐
- Maintain patient/client records ☐
- Diary/schedule ☐
- Vaccination reminders ☐
- Label printing ☐
- Stock control ☐
- Drug ordering ☐
- Desktop publishing ☐
- Email communication ☐
- Web site design/maintenance ☐
- Internet searches ☐
- Veterinary notes ☐
- Database searches ☐
- Multimedia use ☐
- Other(s): *Please specify* ☐

The Royal College of Veterinary Surgeons
Wellcome Library Information Survey 1999

Section C - About you and the Internet

5a Do you use the Internet (either personally or via an intermediary) for work related purposes?

Yes ☐
No ☐

If you answered 'Yes', please go to question 6

5b Please indicate which (if any) of the following statements you agree with. *Tick all that apply*

I use the Internet but not for work purposes ☐
I would like to use the Internet but the costs involved are too high ☐
I have no idea what use the Internet would be to my work ☐
I would like to use the Internet but do not have the time ☐
None of the above ☐

Please move on to question 8 on the next page

6 Please indicate your use of the following types of Internet resource and provide (if applicable) an example of one you consider to be particularly important for each category.

	Frequently	*Occasionally*	*Never*	*Example*
Electronic journals	☐	☐	☐	
Newspapers	☐	☐	☐	
Other media	☐	☐	☐	
Professional institution web sites	☐	☐	☐	
Veterinary information web sites	☐	☐	☐	
Publishers' web sites	☐	☐	☐	
Pharmaceutical companies' web sites	☐	☐	☐	
Online databases	☐	☐	☐	
Newsgroups	☐	☐	☐	
Mailing lists	☐	☐	☐	
Research institution web sites	☐	☐	☐	

Continued on next page

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The Royal College of Veterinary Surgeons
Wellcome Library Information Survey 1999

6 continued

	Frequently	*Occasionally*	*Never*	*Example*
Government web sites	☐	☐	☐	
Library catalogues	☐	☐	☐	
Other: *Please specify*	☐	☐	☐	

7 How do you usually find out about potentially useful Internet resources for your work?

8 Do either you or your practice have an email address?

Yes ☐
No ☐

If you answered 'No' to the above, please move on to Section D on the next page

9 With whom do you exchange information via email for work related purposes?
Tick all that apply

Colleagues in the practice ☐
Other vets in the UK ☐
Vets in other countries ☐
Librarians ☐
Clients ☐
Laboratory staff ☐
Government officials ☐
Academics/researchers ☐
Pharmaceutical company personnel ☐
Other(s): *Please specify*

10 Please indicate the kind of information you exchange via email:

11 What would you like to obtain from the Internet/via email for your work that you are unable to obtain at present?

12 Please indicate any aspects of your computer use where you feel training would be of benefit to you.

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Wellcome Library Information Survey 1999

Section D - About you and information sources

13 How do you keep 'up to date'?

14a Please indicate which of the following information sources you usually consult for each type of information. *Do not put a tick by a source you do not use*

	Drug Information	Diagnostic Information	Therapeutic Information
Practice colleague(s)	☐	☐	☐
Other vets	☐	☐	☐
Conferences	☐	☐	☐
Training courses/workshops	☐	☐	☐
Journal articles	☐	☐	☐
Abstracting/indexing services	☐	☐	☐
Textbooks	☐	☐	☐
Other books	☐	☐	☐
Encyclopedia/compendia	☐	☐	☐
Personal notes/files	☐	☐	☐
Databases	☐	☐	☐
Internet sites	☐	☐	☐
Promotional literature	☐	☐	☐
Company representatives	☐	☐	☐
Practice records	☐	☐	☐
Conference proceedings	☐	☐	☐
Current awareness publications	☐	☐	☐
References/citations	☐	☐	☐
Annual reviews	☐	☐	☐
Laboratory	☐	☐	☐
Other: *Please specify*	☐	☐	☐

14b Please name any specific examples of the information sources that you have ticked above which you consider to be particularly important or useful for your practice work.

15 What do you consider to be your optimum source of information in emergency situations?

16 What are the major problems with the information sources you use?

The Royal College of Veterinary Surgeons
Wellcome Library Information Survey 1999

17 What would be your preferred method of receiving information over a distance?
Please tick one response only

- Via fax ☐
- Verbally over the phone ☐
- Via an audio cassette ☐
- In a paper document via the post ☐
- On a floppy disk via the post ☐
- Via an Internet site ☐
- Via email ☐
- Other: *Please specify* ☐

18 How do you obtain information when you are out on call or working away from the practice?

☐

19 How many times have you obtained veterinary information from a CD-ROM/database in the past month?
Please tick one response only

- 0 ☐
- 1-5 ☐
- 6-10 ☐
- 15-20 ☐
- 21+ ☐
- Do not use CD-ROMs/databases ☐

If you answered '0' or 'Do not use', please move on to question 23

20 Which CD-ROM(s)/database(s) were used?

☐

21 Did you obtain information in this way to…
Please tick all that apply

- Answer patient care questions? ☐
- Prepare a lecture/paper? ☐
- Undertake personal research? ☐
- To stay current? ☐
- Other: *Please specify* ☐

22 Was the searching mainly performed by…
Please tick one response only

- You ? ☐
- An intermediary? ☐
- You and an intermediary? ☐

Please move on to question 24

23 What are your reasons for NOT searching CD-ROMs/databases?
Please rank the statements in order of importance (1=most important)

Only rank statements that apply and do not use the same rank twice

- Lack of equipment ☐
- Cost of searching ☐
- Lack of training ☐
- Lack of time ☐
- Prefer others to do it ☐
- Dislike using computers ☐
- Unsatisfactory results previously ☐
- No access to journals once references found ☐
- Wrong kind of information ☐
- Not sure which databases to use ☐
- Lack of easy access ☐
- Other: *Please specify* ☐

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The Royal College of Veterinary Surgeons
Wellcome Library Information Survey 1999

24 How do you evaluate the information you receive?
Please rank the criteria in order of importance (1=most important)

Only rank criteria that apply and do not use the same rank twice

Personal experience	
Credibility of source	
Methodology used	
Consultation with professional association	
Discussion with practice colleagues	
Discussion with other vets	
Reputation of author	
Other: *Please specify*	

25 Which of the following do you see as being a barrier to your use of information?
Please rank the criteria in order of importance (1=most important)

Only rank criteria that apply and do not use the same rank twice

Time	
Cost	
Delivery delays	
Inadequate technology	
Geographic isolation	
Inadequate staffing	
Dispersal of information	
Inadequate information skills training	
Motivation	
Other: *Please specify*	

26 The following have all been proposed as solutions to the problem of practitioners having little time to find the information they need. Please indicate which one you feel would be most applicable to you.

On-site information intermediary	
Circuit librarian/information specialist	
Personal intermediary at information service	
No preference/don't know	
Other suggestion: *Please specify*	

Section E - About you and veterinary libraries

27a Do you use a veterinary library to obtain any information?

Yes	
No	

If you answered 'Yes' please move on to question 28

27b What (if anything) would prompt you to use a veterinary library?

28 Which veterinary library/libraries do you use?
Please place in order of importance using the boxes provided (1=most important)

	1
	2
	3

29 What were you trying to discover the last time you used a veterinary library?

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The Royal College of Veterinary Surgeons
Wellcome Library Information Survey 1999

30 Which (if any) of the services offered by the library/libraries do you use?

31 What information or services would you like to be able to obtain from a veterinary library that you cannot obtain already?

32 Where do you obtain the non-clinical/non-medical information that you need for your work?

Section F - About you

33 Please provide an approximate indication of your age:

- 30 or younger ☐
- 31-40 ☐
- 41-50 ☐
- 51-59 ☐
- 60 or older ☐

34 Please state your nationality:

35 Would you like a copy of the final report resulting from this questionnaire?

- Yes ☐
- No ☐

36 Would you be willing to be interviewed on the issues raised in this questionnaire?

- Yes ☐
- No ☐

If you answered 'Yes' please indicate any conditions in the space below, e.g. around a certain time of day or after a certain date:

37 Please enter your name (and email address if applicable) below to ensure that you can be contacted if your survey is selected in the champagne prize draw.

38 If you have any comments about this questionnaire or the issues raised by it, please use the space below and on the back of this page.

THANK YOU FOR YOUR TIME AND CO-OPERATION

Appendix E – Email survey

==========
The Royal College of Veterinary Surgeons Wellcome Library
Information Survey 1999
==========

Dear Colleague,

I am writing to invite you to participate in a research project sponsored by the Royal College of Veterinary Surgeons Wellcome Library and the Department of Information Science, City University.

The project will examine a sample of veterinarians in practice in an attempt to determine how information is sought and used. The results of the study are intended to be used as a basis for determining veterinary information provision in the 21st century.

Participation simply requires 15 minutes of your time to complete the questionnaire that follows after this letter.

A bottle of champagne will be awarded to a participant drawn at random from completed questionnaires received.

If you are interested in participating further in this research in the form of an interviewee, there is a box at the end of the questionnaire for you to check. Interviews will explore your attitudes to information in more detail and give you a chance to air your views.

Please rest assured that the utmost discretion and confidentiality will be maintained. All research results will be aggregated for analysis. Complimentary copies of the final report will be available to all participants.

Studies of this nature into veterinary information use are rare in the UK so by agreeing to participate, you will be helping the profession prepare itself for the next millennium.

Yours sincerely

Tom Roper, Head of Library & Information Services
Royal College of Veterinary Surgeons Wellcome Library
Tel: (44)171 222 2021 Fax: (44)171 222 2004
Email: t.roper@rcvs.org.uk
Web site: http://www.rcvs.org.uk

Research to be conducted by:
Tim Wales, MSc Information Science Student, City University
Tel: (44)1727 836061
Email: tim@twales.freeserve.co.uk

==========
Instructions
==========

- Please make that the 'include message in reply' option is turned on in your email program. Instructions on how to check this in common email programs are given below:

  Netscape Messenger - Go to Edit menu. Select Preferences. Click on Messages sub-heading below Mail & Newsgroups in left window. Put a check in box by 'Automatically quote the original message...'.

  MS Outlook - Go to Tools menu. Select Options. Click Internet e-mail tab. Put a check in box by 'When replying to messages...'.

MS Outlook Express - Go to Tools menu. Select Options. Click Send tab. Put a check in box by 'include message in reply'.

(If you have difficulty or your email editor does not have this option then simply cut and paste the whole of this email message into your reply message).

- Please click 'reply' to ensure the questionnaire is returned to the correct address.

- Please use X to indicate a tick where appropriate.

- When typing answers, please make sure your Caps Lock light is ON to enable your responses to be distinguished more easily from the original text.

==========
Section A - About your practice
==========

1] Please indicate the type of practice you work in:

- Mixed practice
- Large animal practice
- 100% equine practice
- Small animal practice

2] How many vets work at your practice (including yourself)?

==========
Section B - About you and computers
==========

3] What type of computer(s) do you use for your veterinary work?

(Tick all that apply)

- Desktop PC
- Laptop PC
- Palmtop
- Macintosh (any type)
- Other (please specify below)

4] What work-related activities do you use a computer for?

(Tick all that apply)

- Accounts/invoicing
- Word processing
- Maintain patient/client records
- Diary/schedule
- Vaccination reminders
- Label printing
- Stock control
- Drug ordering
- Desktop publishing
- Email communication
- Web site design/maintenance
- Internet searches
- Veterinary notes

- Database searches
- Multimedia use
- Other(s) (please specify below)

==========
Section C - About you and the Internet
==========

5a] Do you use the Internet (either personally or via an intermediary) for work related purposes?

- Yes
- No

(If you answered 'Yes', please scroll down to question 6)

5b] Please indicate which (if any) of the following statements you agree with:

- I use the Internet but not for work purposes
- I would like to use the Internet but the costs are too high
- I have no idea what use the Internet would be to my work
- I would like to use the Internet but do not have the time
- None of the above

(Please move on to question 8)

6] Please indicate your use of the following types of Internet resource and provide (if applicable) an example of one you consider to be particularly important for each category.

(Use F for FREQUENTLY, O for OCCASIONALLY or N for NEVER)

- Electronic journals
Example:

- Newspapers
Example:

- Other media
Example:

- Professional institution web sites
Example:

- Veterinary information web sites
Example:

- Publishers' web sites
Example:

- Pharmaceutical companies' web sites
Example:

- Online databases

Example:

- Newsgroups
Example:

- Mailing lists
Example:

- Research institution web sites
Example:

- Government web sites
Example:

- Library catalogues
Example:

- Other type
Please specify:

7] How do you usually find about potentially useful Internet resources for your work?

8] With whom do you exchange information via email for work related purposes?

(Tick all that apply)

- Colleagues in the practice
- Other vets in the UK
- Vets in other countries
- Librarians
- Clients
- Laboratory staff
- Government officials
- Academics/researchers
- Pharmaceutical company personnel
- Other (please specify below)

9] Please indicate the kind of information you exchange via email:

10] What would you like to obtain from the Internet/via email for your work that you are unable to obtain at present?

11] Please indicate any aspects to of your computer use where you feel training would be of benefit:

==========
Section D - About you and information sources
==========

12] How do you keep 'up to date'?

13a] Please indicate which of the following information sources you usually consult for each type of information.

(Do not put a tick by a source you do not use)

DRUG INFORMATION

- Practice colleague(s)
- Other vets
- Conferences
- Training courses/workshops
- Journal articles
- Abstracting/indexing services
- Textbooks
- Other books
- Encyclopaedia/compendia
- Personal notes/files
- Databases
- Internet sites
- Promotional literature
- Company representatives
- Practice records
- Conference proceedings
- Current awareness publications
- References/citations
- Annual reviews
- Laboratory
- Other (please specify below)

DIAGNOSTIC INFORMATION

- Practice colleague(s)
- Other vets
- Conferences
- Training courses/workshops
- Journal articles
- Abstracting/indexing services
- Textbooks
- Other books
- Encyclopaedia/compendia
- Personal notes/files
- Databases
- Internet sites
- Promotional literature
- Company representatives
- Practice records
- Conference proceedings
- Current awareness publications
- References/citations
- Annual reviews
- Laboratory

- Other (please specify below)

THERAPEUTIC INFORMATION

- Practice colleague(s)
- Other vets
- Conferences
- Training courses/workshops
- Journal articles
- Abstracting/indexing services
- Textbooks
- Other books
- Encyclopedia/compendia
- Personal notes/files
- Databases
- Internet sites
- Promotional literature
- Company representatives
- Practice records
- Conference proceedings
- Current awareness publications
- References/citations
- Annual reviews
- Laboratory
- Other (please specify below)

13b] Please name any specific examples of the information sources that you have ticked above which you consider to be particularly important or useful for your practice work.

14] What do you consider to be your optimum source of information in emergency situations?

15] What do you are the major problems with the information sources you use?

17] What would be your preferred method of receiving information over a distance?

(Please tick one response only)

- Via fax
- Verbally over the phone
- Via an audio cassette
- In a paper document via the post
- On a floppy disk via the post
- Via an Internet site
- Via email
- Other (please specify below)

18] How do you obtain information when you are on call or working

away from the practice?

19] How many times have you obtained veterinary information from a CD-ROM/database in the past month?

(Please tick one response only)

- 0
- 1-5
- 6-10
- 15-20
- 21+
- Do not use CD-ROMs/databases

(If you answered '0' or 'Do not use', please go to question 23)

20] Which CD-ROM(s)/database(s) were used?

21] Did you obtain information in this way to...

(Please tick all that apply)

- Answer patient care questions?
- Prepare a lecture/paper?
- Undertake personal research?
- To stay current?
- Other (please specify below)

22] Who was the searching carried out by:

(Please tick one response only)

- You?
- An intermediary?
- You and an intermediary?

(Please move on to question 24)

23] What are you reasons for NOT searching CD-ROMs/databases?

(Please rank the statements below in order of importance 1=most important. Only rank statements that apply and do not use the same rank twice)

- Lack of equipment
- Cost of searching
- Lack of training
- Lack of time
- Prefer others to do it
- Dislike using computers
- Unsatisfactory results previously
- No access to journals once references found
- Wrong kind of information
- Not sure which databases to use
- Lack of easy access

- Other (please specify below)

24] How do you evaluate the information you receive?

(Please rank the following criteria in order of importance 1=most important. Only rank criteria that apply and do not use the same rank twice)

- Personal experience
- Credibility of source
- Methodology used
- Consultation with professional association
- Discussion with practice colleagues
- Discussion with other vets
- Reputation of author
- Other (please specify below)

25] Which of the following do you see as being a barrier to your use of information?

(Please rank all that apply to you 1=most important. Only rank criteria that apply and do not use the same rank twice)

- Time
- Cost
- Delivery delays
- Inadequate technology
- Geographic isolation
- Inadequate staffing
- Dispersal of information
- Inadequate information skills training
- Motivation
- Other (please specify below)

26] The following have all been proposed as solutions to the problem of practitioners having little time to find the information they need. Please indicate which one you feel would be most applicable to you.

- On-site information intermediary
- Circuit librarian/information specialist
- Personal intermediary at information service
- No preference/don't know
- Other suggestion (please specify below)

==========
Section E - About you and veterinary libraries
==========

27a] Do you use a veterinary library to obtain any information?

- Yes
- No

(If you answered 'Yes' please scroll down to question 28)

27b] What(if anything) would prompt you to use a veterinary library?

(Now move on down to question 32)

28] Which veterinary library/libraries do you use?

(Please state in order of importance using the rankings provided)

- 1
- 2
- 3

29] What were you trying to discover the last time you used a veterinary library?

30] Which (if any) services offered by the library/libraries do you use?

31] What information or services would you like to be able to obtain from a veterinary library that you cannot obtain already?

32] Where do you obtain the non-clinical/non-medical information that you need for your work?

==========
Section F - About you
==========

33] Please give a rough indication of your age:

- 30 or younger
- 31-40
- 41-50
- 51-59
- 60 or older

34] Please state your nationality:

35] Would you like a copy of the final report resulting from this questionnaire?

- Yes
- No

36] Would you be willing to be interviewed on the issues raised in this questionnaire?

- Yes
- No

(If you answered 'Yes' please indicate any conditions in the space below e.g. around a certain time of day or after a certain date)

37) Please enter your name below to ensure that you can be contacted if your survey is selected in the champagne prize draw.

38] If you have any comments about this questionnaire or the issues raised by it, please use the space below

==========

End of Survey - Thank you for your time and co-operation

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Appendix F – Survey reminder letter

Appendix G – Interview invitation letter